No. 2203

# United States
# Circuit Court of Appeals

## For the Ninth Circuit.

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# Transcript of Record.

**(IN THREE VOLUMES)**

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MORSE S. DUFFIELD and LEWIS A. JEFFS,

Appellants,

vs.

SAN FRANCISCO CHEMICAL COMPANY,

a Corporation,

Appellee.

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**VOLUME III.**

**(Pages 593 to 874, Inclusive.)**

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**Upon Appeal from the United States District Court for the District of Idaho, Southern Division.**

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(Testimony of Fred B. Weeks.)

Q. Well, taking the definition as I have given it to you, wherein do you distinguish this deposit or these deposits under consideration?

A. The phosphate deposits do not contain any metallic minerals—ores.

Q. Mr. Weeks,—

A. And your definition does not imply that the vein or lode must contain metallic substances.

Q. Well, inasmuch as the question I have asked does not imply any metallic mineral, wherein (I ask you again) does the deposit or deposits under consideration fail to come within the definition suggested?

A. I don't see that I can answer your question more specifically than I have already stated: —because it lacks in metallic constituents.

Q. It is leaving out entirely, Mr. Weeks, metallic constituents; and leaving that out, wherein is there any difference? [639]

A. The phosphate deposit is a mineral-bearing rock, and in this case it agrees with the definition you suggested.

Q. Take, for another example, this definition: "A continuous body of mineralized rock, lying within any other well-defined boundaries of the earth's crust, and under it." Does the deposit or deposits in question come within such a definition of a lode or vein?

A. The deposit or phosphate is not a mineralized rock; it is not a rock in which minerals have come into in any way; it is a rock in itself. We can call a limestone a mineralized rock, or almost any rock that you could name is a mineralized rock; but yet

(Testimony of Fred B. Weeks.)

it does not come within the meaning of the definition which you have suggested.

Q. This deposit is a continuous body?

A. Yes, sir.

Q. It is a mineralized rock? A. No, sir.

Q. Is it not?

A. No, sir. In the sense that mineral has come into a rock, it is not mineralized rock. All rocks are formed of minerals.

Q. In this continuous body do you mean to say that the rock contains no mineral?

A. It is all mineral—the whole rock is mineral.

Q. Well, then, it is mineral rock?

A. Well, it is mineral rock the same as all rock is mineral rock.

Q. Well, it is mineralized rock, if you please?

A. No, sir. [640]

Q. Now, your definition is so fine—to me, at least,—that I must ask you to give it again.

A. My conception of a mineralized rock is a rock in which mineral has come in some form after the formation of the rock itself. All rock is mineral of some kind or other; but it is not necessarily mineralized rock.

Q. Rock containing phosphorus would be mineralized rock, would it not?

A. I don't know any rock containing phosphorus.

Q. Well, rock containing tricalcic phosphate—phosphorus—would be mineralized rock, would it not? A. No, sir.

Q. It wouldn't? A. No, sir.

Q. Why?

(Testimony of Fred B. Weeks.)

A. Because the rock was formed as a whole, and no mineral matter has come into it subsequent to the formation of the rock itself.

Q. I see. So that if we should assume that any mineral substance had come into this rock since the rock was formed, your answer would be different?

A. Yes, sir, in part it would be. It would depend upon the circumstances.

Q. With that assumption, what would your answer be?

A. That as a general proposition it would not be mineralized rock.

Q. What, in that connection, in your opinion, would be required to make it mineralized rock? [641]

A. It would require a mineralization, to some extent, to be considered mineralized rock. Simply a little particle of mineral that might be found in a rock as an accidental occurrence I would not term that rock a mineralized rock.

Q. Yes. Now, coming back to the rock in question: If there had been a subsequent deposition of any of the mineral constituents, under any conditions, would you call this body mineralized rock?

A. That would depend upon the amount of deposition of such material.

Q. Take the ore deposit, or the deposit in question, what would be necessary, as a secondary deposition, to bring it within your idea of a mineralized rock?

A. There would have to be a deposition of a noticeable amount of secondary minerals.

Q. What? What minerals?

(Testimony of Fred B. Weeks.)

A. Well, any minerals.

Q. Well, coming to this rock—a deposition of what?

A. Why, you could name any of the metallic minerals that might be deposited in it.

Q. Name them, that are now found in it.

A. There are none.

Q. You were not asked about metallic mineral. Leaving out from your consideration metallic, will you please answer my question?

A. Calcium phosphate; iron; aluminum. Those are the principal constituents.

Q. Would any one of the three you have mentioned suffice? [642]

A. That would depend upon whether they came into the rock after the rock was formed or not.

Q. But we are assuming, Mr. Weeks,—

A. Well, as I have said, that would depend upon the amount of the mineralization, whether I should call it a mineralized rock or not.

Q. Taking this rock as you have found it to be, in any of the ground involved in these cases?

A. Well, at no place have I ever seen the deposition of minerals after the formation of the rock itself—of any minerals.

Judge DEY.—That, I beg to say again, is not the question. The Reporter will read it.

The Special Examiner thereupon repeated the following question:

"Q. Take the ore deposit, or the deposit in question, what would be necessary, as a second-

(Testimony of Fred B. Weeks.)

ary deposition, to bring it within your idea of a mineralized rock?''

A. It would require the removal of some portion of the phosphate rock, and the deposition in its place of a considerable amount of other mineral material.

Q. What, as applied to the deposit in question?

A. Well, I would have to illustrate that by supposing that the cementing material which cements these oolites together, was dissolved and removed, and in its place, for instance, iron formed the cementing material, replacing and taking the place of this cementing material which had previously been there.

Q. Take the deposition of calcium phosphate, and assume [643] that it was a subsequent deposition, in these deposits under consideration; what would you say, then, as to whether or not this deposit was mineralized rock?

A. I think you are making an impossible condition. I cannot conceive of what material in this rock can be removed and replaced by a further amount of calcium phosphate.

Q. That is your only answer?

A. I think that is the best answer I can give.

Q. Assuming that any of the minerals found in the deposit in question, in the quantities in which they exist there, came in that position by replacement, or secondary deposition, what would you say under those conditions as to whether or not this deposit is mineralized rock?

A. That would depend on the amount of such replacement, or secondary deposition.

(Testimony of Fred B. Weeks.)

Q. The question covers that phase of the matter, I think you will find.

A. The question says "any." I say it depends on the amount.

Q. Taking the amount as you have found it to be in the deposit in question?

A. Well, under the terms of your question, I don't think I could say that it was mineralized rock.

Q. Wherein are the terms of my question ambiguous to you?

A. I don't know that I can explain. I simply don't comprehend what you are driving at, probably. I am trying to make the best answers to your questions that I can.

Q. When I say to you that assuming any one or more of the [644] minerals that you find contained within the rock in question, to the extent and quantity that you find, were a subsequent deposition, would you consider this rock mineralized rock?

A. No, I don't think so.

Q. Why not?

A. To make this phosphate deposit what you would term a mineralized rock, would require the deposition in some form of mineral substances so as to change its constitution from what it was originally to something else quite different; and to warrant using the term "mineralized rock," would require the deposition of a considerable amount. And in this phosphate rock, in its present constituents and in the amounts of materials which we find there, I can't conceive of what portion of what materials, or

(Testimony of Fred B. Weeks.)

what portions of such materials, could be removed by any known process of nature and other materials put in its place to that extent that we would call it a mineralized rock.

Q. Wherein is it lacking in being a mineralized rock?

A. Because it is the rock itself, and it is not mineralized, as I have explained before.

Q. Assuming the subsequent deposition that I have stated before, of any or all of the mineral substances contained in the rock, do you still insist and state that it is not mineralized rock?

A. Yes, sir. I think I answered that question before.

Q. How is limestone dolomatized?

A. Well, the dolomatization occurs at the same time that the limestone is formed.

Q. How, is the question.

A. By the presence of magnesia. [645]

Q. You say "at the time the limestone was formed." Are you positive of that? Do you know it?

A. Why, the same as I know the mode of formation of any sedimentary rock—by the study of the rock itself.

Q. Well, do you claim to know? A. Yes, sir.

Q. If this is not mineralized rock, is it mineralized matter? A. No, sir.

Q. It is not mineralized matter?

A. No, sir. It seems to me I can make that point clear by stating that no matter whether you call it

(Testimony of Fred B. Weeks.)

mineralized matter or mineralized rock, the matter or rock must have been in existence in the first place, and then some of it removed and mineral matter come in later.

Q. That is what I am assuming as happening or occurring; and upon that assumption would you change your answer heretofore given?

A. No, sir; because I have said that in this phosphate bed I cannot conceive of any process by which you are going to remove any considerable portion of the materials which now form it, and replace it by something else which is mineral-bearing.

Q. But the question, notwithstanding, is based upon the supposition that such a change had been made, or occurred —

A. Well, I can't conceive—

Q. — and upon that supposition, please answer.

A. I should say, no, sir, then.

Q. Why do you say "no" to that? [646]

A. Because it is an impossible condition.

Q. You know that, do you?

A. I am satisfied of it.

Q. Do you know it? A. Yes, sir.

Q. What is the source of your knowledge?

A. A study of the materials.

Q. And you are so firmly fixed in that, that you could not even suppose for the purposes of a question that it was otherwise? A. No, sir.

Q. What? A. No, sir.

Q. Suppose that five feet in width or thickness of this phosphate rock, instead of being found lying in

(Testimony of Fred B. Weeks.)

place, conformable to the stratification, existed in a fissure, cutting the beds; what would you say as to the fissure so filled constituting a lode or vein?

A. I couldn't say anything about it, because it is simply a physical impossibility for this bed to have occupied any such a position.

Q. Assume, notwithstanding, that it did; please answer.

A. Well, your assumption is absurd from my standpoint, and therefore I cannot use it. When I say that it cannot exist under those conditions, why I don't see how I am going to assume anything about it.

Q. You have testified this morning to a fissure cutting the bed filled with Gilsonite, or asphaltum, or some hydrocarbon, it makes no difference what; have you not? [647] A. Yes, sir.

Q. Now, just assume that that fissure, of the width or breadth of five feet, was filled with this material.

A. Well, the fact is that such a fissure cannot be filled with this material.

Q. Suppose it was; what would you say as to it being a lode or vein?

A. I haven't anything to say of such a supposition. It is unreasonable.

Q. Eh? A. It is an unreasonable supposition.

Q. In what respect is it so unreasonable that you cannot answer?

A. Because you couldn't fill a fissure with this material.

Q. You don't refer to me personally, do you?

(Testimony of Fred B. Weeks.)

A. I did not intend any such reflections at any time. I was referring to the phosphate bed.

Q. Well, suppose I did fill such a fissure with such material; will you please answer the question?

A. I cannot imagine such a condition.

Q. And assuming such a condition to actually exist, and assuming that such a condition did exist; wherein would it not be a lode or vein, in your opinion?

A. I don't care to make an answer to an unreasonable supposition. I consider that so unreasonable that I can't answer it.

Q. With all your remarkable knowledge and learning as to the genesis of ore deposits, do you still insist that the question [648] is so foolish that it is not worthy of an answer from you, Mr. Weeks?

Mr. BUDGE.—We object to the question as improper; as insinuating; and as offensive; and as not proper in view of the evident attempt of the witness to be fair and responsive.

Judge DEY.—I don't mean it in any sense offensive; but this witness has taken over an hour in refusing to answer a question based upon the supposition or suppositions I have stated, and I think it is justified under the conditions that now exist.

WITNESS.—The witness wishes to have it read into the record, and state that he has attempted to answer each and every question of counsel for the plaintiff, to the best of his ability; and in so far as he is able he is willing to answer all questions assuming any proposition; but when those assumptions relate to matters that are a physical impossibility, I don't

(Testimony of Fred B. Weeks.)

think that it is necessary for me to answer them, in assuming something that I consider cannot happen.

Judge DEY.—Are you through with your speech?

WITNESS.—Yes, sir.

Judge DEY.—Why did you want to inject those remarks into this record?

Mr. BUDGE.—We object to that as immaterial, [649] and a continuation of unfair conduct on the part of counsel.

Judge DEY.—Where have I been unfair in any question asked you, Mr. Weeks?

WITNESS.—I didn't state that you had been unfair.

Mr. BUDGE.—I stated it, Judge.

Q. Is it because it is impossible for you to answer, or because you decline to answer the question, assuming this phosphate rock which you have described was found in the form of a fissure cutting the bed, whether in your opinion it would be classified as a lode or vein?

A. As I have stated before, I consider it a physical impossibility for the material of this phosphate deposit to occupy a fissure or vein; therefore I decline to answer upon such an assumption—something that is impossible.

Q. Now, supposing that this deposit, in the form it is now found, was valuable for gold or silver or copper or lead; what would you say as to it being a lode or vein?

A. I think it would depend upon the form and character of such a deposit of gold or silver or lead,

(Testimony of Fred B. Weeks.)

or other materials that I mentioned as to whether I would consider it a vein or lode.

Q. I say, sir, in the form and character in which this deposit is now found, as you have described it, with strike and dip, in place, between walls, in the body of the mountain?

A. I don't think, if it occupied the same position and occurred in the same form and character as this phosphate bed, that it would be a vein or lode. **[650]**

Q. It would be a placer, would it?

A. No; I shouldn't term it a placer in the true—

Q. What would you term it?

A. I don't know of any distinct name you could call it, other than a bed, if it existed in the same form and character as this does.

Q. Wherein would it not be a vein or lode, in your opinion?

A. Because it is the original deposition of the material in the place in which it was formed.

Q. This gold or silver or copper or lead matter?

A. Yes, sir.

Q. Then, it is your opinion that wherever metallic minerals in paying quantities are found, unless produced by secondary, or brought by secondary deposition to the place where they are found, it would not be a vein or lode? A. No, sir.

Q. Is that the only reason?

A. I wouldn't want to say positively that that was the only reason; it is the essential reason.

Q. What other reason have you to put forth?

A. I haven't any in mind at the present time.

(Testimony of Fred B. Weeks.)

Q. Then, it is your opinion that whether rock in place, with continuity, strike and dip, valuable for metal or mineral therein contained, is to be located as a vein or lode, is to be determined by ascertaining the time and source and origin of the metal or mineral, is it? A. That is only in part. **[651]**

Q. In part that is true?

A. In part that is true.

Q. Now, what else?

A. That is not the principal part.

Q. What else is there essential.

A. The principal thing is the form and character of the deposit itself.

Q. In what particular form must the deposit be in, as distinguished from the form in which this deposit is found, to be located as a vein or lode?

A. The materials which constitute a vein or lode must be of a secondary nature, and have come to its place at rest at a time later than the formation of the enclosing rock masses.

Q. Perhaps I didn't understand what you meant when you used the word "formed," in which it is found. Will you please make clear what you mean by the use of the word "formed," in that connection?

A. In this deposit of phosphate of lime, it occupies a definite position between layers of sedimentary rock; it always occupies that position; it always has that same form of a sedimentary bed, enclosed, and following the dip and strike of the beds which enclose it. A vein or lode does not conform to the dip or strike of the rock which encloses the vein or lode, and

(Testimony of Fred B. Weeks.)

the materials are not necessarily the original materials which are in that vein or lode.

Q. Have you now mentioned all the distinguishing characteristics that you desire to in the use you make of the word "formed," and characteristics? [652]

A. I think those are the distinguishing features—what I think of.

Q. What you have in mind?

A. Yes, sir; what I have in mind at the present time.

Q. It is your opinion, then, that there is and can be no such thing as a stratified lode or vein? Please answer.

A. There can be no stratified vein or lode formed as a stratified rock is formed.

Q. Is there or can there be any such thing as a stratified lode or vein, valuable for its mineral contents? A. No, sir.

Q. Why do you say there cannot be such a thing?

A. I don't think you could lay down materials into strata in such a form as to form a stratified vein or lode.

Q. Do you mean to say that there is no such vein as a stratified vein or lode? A. Yes, sir.

Q. That is to say, from your observation and experience you state that? A. Yes, sir.

Q. Outside of this Western Phosphate Area, your practical experience and investigation has been very limited, has it not?

A. No, sir; I don't think so—not outside of the Western Phosphate Field. I should say it was extensive.

(Testimony of Fred B. Weeks.)

Q. Outside of that? A. Yes, sir.

Q. In mineral deposits? A. Yes, sir.

A recess was thereupon taken until two o'clock P. M. [653]

At two o'clock P. M. the hearing was resumed.

FRED B. WEEKS, a witness heretofore called in behalf of the defendant, and duly sworn, being recalled for further cross-examination, testified as follows, to wit:

Cross-examination.

(By Judge DEY.)

(At the request of Judge Dey, the Special Examiner repeated the latter part of the testimony of this witness just prior to adjournment for the noon recess, as follows:)

"Q. Do you mean to say that there is no such vein as a stratified vein or lode? A. Yes, sir.

"Q. That is to say, from your observation and experience you state that? A. Yes, sir.

"Q. Outside of this Western Phosphate Area, your practical experience and investigation has been very limited, has it not?

"A. No, sir, I don't think so—not outside of the Western Phosphate Field. I should say it was extensive.

"Q. Outside of that? A. Yes, sir.

"Q. In mineral deposits? A. Yes, sir." [654]

Q. Assume that this deposit that dips 85° that you have described, consisted of apatite instead of the present—of the materials that you have described here; what would you say as to whether or not it

(Testimony of Fred B. Weeks.)

would be located as a lode or vein?

A. If this material comprising this bed of phosphate was composed entirely of apatite, in its crystalline form, it would be a mineral-bearing deposit.

Q. Would it be a ledge or vein, in your opinion, and locateable as such?

(No answer.)

Q. We are waiting.

A. Yes, sir, I understand. I think there are conditions under which this bed, as a whole—composed entirely as a whole of the mineral apatite, might be located as a vein or lode.

Q. Properly so, in your opinion? A. Yes, sir.

Q. And I will ask you now the same question, substituting in the place of apatite, paramorphite?

A. It might be.

Q. Why do you say "might be"?

A. Well, there might be a difference of opinion about it, in my opinion. As I said, under proper conditions it probably would be, or could be.

Q. And your opinion is that it would be proper to locate it as a lode or vein?

A. When I answered yes to that question, my answer was under the supposition that this whole bed represented by the phosphate would be represented by the mineral form paramorphite, as you suggest. [655]

Q. That was the question. That is to say, or economic or commercial value? A. Yes, sir.

Q. Isn't phosphorite and allotropic a form of apatite?

(Testimony of Fred B. Weeks.)

A. Phosphorite is a variety of apatite, which has a given density, form, and its particular structure being fibrous, or radiating.

Q. Assume now, if you please, that this deposit, with the dip, strike, position and place as you have described it, was phosphorite, in your opinion, would it not be properly located as a vein or lode?

A. Bearing in mind that the whole bed is to be made up entirely of the variety of apatite called phosphorite, it would be located as a vein or lode.

Q. I wish you would, if you can, answer the question without any further assumption than the question conveys.

A. Well, I am answering it with that in mind that I have stated.

Q. Can you answer the question yes or no?

A. No, sir.

Q. Why?

A. I don't think it can be answered that way.

Q. Well, why?

A. It would not be a proper answer.

Q. Why not?

A. Because your answer would be incorrect, if you said yes or no.

Q. Tell us why. [656]

A. I don't see how I can go any further.

Q. You can't explain why it would be incorrect?

A. Other than what I have said.

Q. I ask you the question again: Assuming that this deposit in question, with the strike, dip, continuity, boundaries and form in which you have de-

(Testimony of Fred B. Weeks.)

scribed it, consisted of phosphorite, whether or not in your opinion it would be a vein or lode, and locateable as such?

A. When I say yes to that question I have the same thought in my mind that I have expressed before.

Q. Please answer the question as now asked.

A. I have answered it to the best of my ability.

Q. Answer it again.

A. Yes—bearing in mind what I have said before that I had in mind.

Q. Bearing in mind what?

A. That the whole bed of phosphate, in its entirety, is made up of the variety of apatite in the crystalline form of phosphorite.

Q. Why do you affix the requirement indicated by the words "whole bed is made up"?

A. Because that should be a condition.

Q. Why do you place that condition, is the question?

A. Because the condition may exist in which only a portion of the bed is made up of phosphorite; and it might not, in my opinion, then be a vein or lode.

Q. I am assuming that the portion is of commercial or economic value? A. Yes, sir. [657]

Q. Now, explain clearly, please, just why you make the distinction between the whole and a portion?

A. Because I think it is necessary that the whole of this bed should be formed of the mineral phosphorite.

Q. Well, why the whole, rather than a profitable

(Testimony of Fred B. Weeks.)

part or portion thereof?

A. Because it would be necessary to mine the whole of it—to use it as mined as a whole.

Q. To make it a lode or vein, is the question.

(No answer.)

Q. We are waiting.

A. Yes, sir, I understand. I think it would be necessary that the bed be formed in its entirety of the mineral phosphorite in order to make it a mineral-bearing rock, subject to the vein or lode location.

Q. Just explain why.

A. It would require those conditions in order to have the form and character of a deposit subject to vein or lode.

Q. That is just what I want to know, wherein it would require the entire deposit rather than a valuable part of the deposit, to make it a vein or lode.

A. The material which comes from the vein or lode contains a valuable material, and other nonvaluable materials, which we call gangue, and we separate the gangue material to get the valuable portion of it. In the phosphate material we mine it as a whole and use it as a whole; we do not separate it to get out any valuable particle of it.

Q. Do you consider that you have just answered the plain, **[658]** simple question, why (substituting phosphorite) the entire deposit must be phosphorite, rather than a portion of it, assuming the portion to be of economic value? A. Yes, sir.

Q. Then, your position is this, is it not: That if this entire deposit was phosphorite, it would properly be

(Testimony of Fred B. Weeks.)

classed and be located as a vein or lode; but that if only a portion of the deposit was phosphorite, notwithstanding it had a commercial or economic value, the deposit would not be a lode or vein?

A. Yes, sir.

Q. Just state again, please, where you draw the line of demarcation under the two conditions as given.

A. That the vein or lode is composed of its valuable material and gangue material; and that it is necessary to separate the two to get out your valuable material. In this case, the phosphate comprising the whole bed is mined and used as a whole.

Q. But in the one instance it would be a lode or a vein, and in the other a placer? Is that your position?

A. Well, my position is that it is not a vein or lode; whether it comes under the proper term of "placer" is a question as to the interpretation of what one puts upon "placer."

Q. Now, Mr. Weeks, a miner or a prospector desiring to make a location, finding a valuable deposit of mineral in the mass of the mountain, with a regular defined dip and strike, and between walls of sedimentary formation; what additional facts would you have to have to determine—before he could intelligently determine whether it was a lode or vein subject to location **[659]** as such?

A. I think it would be necessary for him to determine from the examination of the bed whether it had or had not the characteristics of a vein or lode.

(Testimony of Fred B. Weeks.)

Q. That fully answers the question, does it?

A. Why, there might be other considerations; I think that is the principal one—the determining factor.

Q. Well, is there any other, in your opinion?

A. I think that covers the ground.

Q. If the prospector found that the mineral deposit conformed to the stratification, then it is your opinion, is it not, that it is not a lode or vein?

A. It would in most cases wherein the vein or lode would follow along the bedding-planes between the sedimentary strata.

Q. Any other exception? A. I think not.

Q. Now, just illustrate what you mean by the exception you have just given.

A. Where the mineral-bearing solutions, penetrating the strata of the earth's crust, instead of cutting across a bed finds the point of least resistance along the bedding-planes between these beds—would constitute the principal example.

Q. In other words, the prospector would have to determine as to the action of the mineral-bearing solutions; is that it?

A. He would determine that from his observation of what the material itself said.

Q. That would be one of the things he would have to determine? [660]

A. Yes, sir; and he would determine it in that way.

Q. He would determine it in what way?

A. By his observation.

Q. Of what?

(Testimony of Fred B. Weeks.)

A. Of the bed of the material he was examining.

Q. What observation would be necessary to make that determination?

A. Why, he would find on exposure of the material that the ore-bearing horizon was following the line between two sedimentary strata—an observation not very difficult to make.

Q. Well, if he found that would it be a vein or lode? A. Yes, sir.

Q. It would be? A. Yes, sir.

Q. Then, in your opinion, it would be necessary—it would be limited only to deposits formed from solutions? A. A vein or lode would be.

Q. In other words, the prospector in such a case would have to determine the source from which the mineral came, would he? A. No, sir.

Q. He would not be? A. No, sir.

Q. The manner in which it came?

A. In a sense, yes, in that the mineral-bearing solutions had followed along this bedding-plane, would be the manner in which it came into its place.

Q. Then, in a sense, it would be necessary to determine the **[661]** manner in which the mineral solutions came? A. Yes, sir.

Q. If they came and were deposited by such action, it would be a vein or lode, in your opinion?

A. Yes, sir.

Q. If, on the contrary, it came by having been placed where it is before the period of the uplift or deformation, it would not be a vein or lode; is that right?

(Testimony of Fred B. Weeks.)

A. I don't quite see that connection. Will you read that?

(The last question was repeated.)

A. I don't think so.

Q. It would still be a vein or lode?

A. Yes, sir, it might be.

Q. It might be? A. Yes, sir.

Q. Why do you say "might" in that connection?

A. Well, I will say it is.

Q. Yes—a vein or lode? A. Yes, sir.

Q. Then, if I understand you, if at any past period, whatever position it might have occupied, the mineral deposit came in solution and was deposited, forming beds, it would at the present time be a lode or vein? Is that it?

(No answer.)

Q. In other words, to make it a little clearer, is it of any importance, in your opinion, the determination of when the mineral deposit was formed?

A. It is of importance in this sense, that the mineral-bearing **[662]** solutions from which the minerals are deposited, enter into a rock already formed, and that the formation of such ore-zones are later than the materials which the ore-bearing solutions are penetrating.

Q. Then, it is your opinion that a prospector, in determining whether the deposit found in the form you have described to be the one involved in these cases, is a vein or lode and locateable as such, he must determine whether it was filled with the mineral substances—whether it had been originally rock that

(Testimony of Fred B. Weeks.)

had been subsequently filled with mineral substances; is that it? A. Yes, sir.

Q. How would that be determined by the miner—the ordinary miner and prospector?

A. In the ordinary vein or lode from the out-crop the prospector could determine more or less accurately the boundaries of his vein or lode, and the fact as to whether the ore had come into such rock subsequent to the formation of the country rock.

Q. He would know all about it, eh?

A. Oh, I don't know that he would know all about it. He would from the general observations he would make, I think. In fact, I have talked with many prospectors who have exhibited such a knowledge.

Q. Is phosphoric acid carried in solution?

A. No, sir.

Q. It is not? A. No, sir.

Q. How is it? **[663]**

A. It is carried in compound with some other material like this calcium phosphate.

Q. Well, in what way was it carried and deposited in this deposit?

A. I think in this deposit it was carried in solution as the chemical compound calcium phosphate.

Q. You think? A. Yes, sir.

Q. Do you mean to say you don't know?

A. Yes, sir.

Q. Eh? A. Yes, sir.

Q. Which?

A. I mean to say that I think, not that I know.

(Testimony of Fred B. Weeks.)

Q. Do you know anybody that does know?

A. No, sir.

Q. At the time of it being carried, what was the bed or stratum—in what condition, and of what material?

A. The formation of the calcium bed began with the first deposition of the calcium phosphate upon the underlying limestone, and the bed was built up particle by particle, as these sediments were brought in and the matter in solution deposited.

Q. Particle by particle, like grains of sand?

A. Yes, sir, you may say so; that would be a comparison.

Q. Now, do you know that, or do you think?

A. I know it.

Q. You know it? Yes, sir.

Q. Was the limestone replaced? **[664]**

A. There was no limestone there at the time this bed was being formed, except the bed that the phosphate rests upon.

Q. I understood you— Just read that answer back.

(The following answer was repeated:)

> "A. The formation of the calcium bed began with the first deposition of the calcium phosphate upon the underlying limestone, and the bed was built up particle by particle, as these sediments were brought in and the matter in solution deposited."

Q. Did it replace this underlying limestone?

A. No, sir.

(Testimony of Fred B. Weeks.)

Q. It didn't? A. No, sir.

Q. It was built on top of it? A. Yes, sir.

Q. That, I understand you to say, is not a theory but a fact? A. Yes, sir.

Q. Was it a bed of mud?

A. Probably of the consistency of mud at the time it was formed.

Q. "Probably?" Don't you know?

A. Well, I will say it was.

Q. Well, do you know? A. Yes, sir.

Q. How do you know?

A. From the study of the bed itself, and from the observations [665] of the formation of sediments at the present time.

Q. Now, will you please tell us if it came in solution as you have stated, why it cannot be found in fissures?

A. The fillings of fissures come from the interior of the earth, or from some portion of its crust. There were no fissures in existence during the formation of this bed for this material to fill.

Q. Now, do you think that answers the question?

A. Will you read the question?

(Said question was repeated.)

A. From the fact that the water carrying this material in solution is in a different form and different position than that which fills fissures.

Q. In what way? Just make it clear.

A. From the fact that this ocean water is carrying in suspension certain mineral matters, and it is spread out over a vast area; while the water carrying

(Testimony of Fred B. Weeks.)

mineral-bearing solutions in veins is confined within the limits of the veins and comes up from the depths of the earth.

Q. Did it undergo any leaching process?

A. This phosphate bed?

Q. Yes?

A. Except as a very small amount immediately upon the surface of the ground, at present there has been no leaching action.

Q. No leaching action? A. No, sir.

Q. You were a witness last December, were you not, in the case of the Union Phosphate Company? You testified as a witness? A. Yes, sir. **[666]**

Q. I read from your testimony, your direct examination, page 290 of the record:

"Q. Is it a sort of a leaching process?

"A. It probably was a leaching process, in that phosphoric acid had been brought into waters from time to time in which the phosphate bed was laid down, leading the other beds.

"Q. Now, what was the origin of the phosphoric acid? Does it come from the stone, or something else?

"A. Well, phosphorus is one of the most widely distributed elements that we have in nature."

Is that your testimony? A. Yes, sir.

Q. That is correct?

A. It is correct in connection with what it is taken.

Q. Is the statement there correct, or do you desire to change it now?

(Testimony of Fred B. Weeks.)

A. I don't desire to change that statement at all; but perhaps I can make it clearer as to what leaching was referred to in that statement.

Q. You say: "It probably was a leaching process, in that the phosphoric acid had been brought into waters from time to time in which the prosphate bed was laid down, leaching the other beds." Isn't that clear?

A. Well, "leaching the other beds" means the beds from which the phosphoric acid was originally obtained.

Q. Before transportation? A. Yes, sir. **[667]**

Q. What? A. Yes, sir.

Q. You didn't say so here, did you?

A. Well, that depends on your construction of it.

Q. No—I am asking yours?

A. I think so. That is what "leaching the other beds" refers to.

Q. Now, in answer to one of my questions a while ago, I understood you to say that phosphoric acid was not in solution at any time.

A. Well, I didn't mean to say that phosphoric acid —I meant to say that phosphoric acid alone is not in solution.

Q. The question was asked you in this record by your counsel, or by the counsel for the Union Phosphate Company.

> "Q. Would you say the phosphate was deposited in solution?
>
> "A. I think so, to a very large extent."

Now, that is the fact, isn't it?

(Testimony of Fred B. Weeks.)

A. That the phosphoric acid in combination as calcium phosphate was deposited. That is my statement now.

Q. Now, do you know whether the phosphoric acid replaced the limestone by metasomatic action?

A. No, sir.

Q. You don't know? A. No, I don't.

Q. Is it not apparent to you that a miner or prospector would have a grave problem on his hands, according to the basis you have given for determining whether this deposit would be a lode or placer?

**[668]**

A. Yes, sir, I presume he would have. I think it is a question to a good many people.

Q. One that even great scientific men differ upon?

A. No, I don't think so.

Q. Do you know Professor Van Hise?

A. Yes, sir.

Q. I was looking for his initials. A. C. R.

Q. Do you know of the Treatise by him on Metamorphism?

A. Yes, sir, I have read a good many portions of it.

Q. Is he of acknowledged reputation?

A. Yes, sir.

Q. And is his book a standard as authority on scientific matters?

A. Well, it would be considered as authority by those who agreed with his propositions. Perhaps those who don't agree with it would not accept him as an authority. He is an authority in that way, that not everybody agrees with him.

(Testimony of Fred B. Weeks.)

Q. Well, that is true of them all, isn't it?

A. Yes, sir.

Q. That happens with all? A. Yes, sir.

Q. But on science he is of reputable authority?

A. Yes, sir.

Q. Of recognized standard?

A. Taken as a general proposition, it is.

Judge DEY.—Mr. Jack, I wish you would help me out a little bit, and read certain paragraphs. [669] Now, wait a moment.

Q. Mr. Weeks, I read you from the treatise referred to, with a view of asking you whether or not you coincide, concur or not, with the position taken: Page 93, it is Volume 17, Van Hise, "A TREATISE ON METAMORPHISM," a publication of the Geological Survey:

Mr. JACK.—"Also the moderately strong acids $H_2 SO_3$, and $H_3 PO_4$, are not abundant, although phosphoric acid is rather widespread."

Page 206—

Mr. BUDGE.—Well, do you want to read them all to him?

Judge DEY.—Yes.

Mr. BUDGE.—I don't see how he can answer to them, if they relate to different matters. I think he could give a more intelligent answer if his answer was limited to one particular portion read, without going through the entire volume and then asking him for his answer to all of them.

WITNESS.—It would be impossible to give a direct answer in such a case.

(Testimony of Fred B. Weeks.)

Mr. JACK:

Page 206: "Phosphation is the union of phosphoric acid with base, or the substitution of phosphoric acid for another combined acid, in either case producing phosphates."

Page 356: "Occurrence.—Apatite is one of the most widespread, if not the most widespread, [670] of all the subordinate constituents of rocks. It is a common, if not an almost universal, constituent of the plutonic rocks, occurs almost as broadly in the volcanic rocks, and is found in many varieties of unaltered or little altered, sedimentary rocks, such as limestone, shales, sandstones, etc.; and, finally, it is almost everywhere found in the metamorphosed igneous and sedimentary rocks.

"Alterations.—The only alteration which is recorded for apatite is to osteolite, which is reported as having the same composition as apatite, except that there has been a loss of part or all of the fluorine or chlorine.

"It is certain, however, that in the belt of weathering of the zone of anamorphism apatite is slowly dissolved. This is shown by comparative analyses of the weathered with the unweathered varieties of the same rock. This fact has been frequently noted in reference to the iron ores, because here the presence or absence of phosphorus is of such great importance. It may be stated that in the iron ores it is the general rule that those parts of deposits which have been long subjected to weathering bear a smaller proportion of apatite than the continuations

(Testimony of Fred B. Weeks.)

of these same deposits in the belt of cementation."

"The depletion of the surface rocks in apatite [671] would seem to furnish an adequate source for the apatite in veins, this mineral being taken into solution near the surface and redeposited deeper down, thus being transported from the belt of weathering to the belt of cementation."

Page 975: "Phosphorous. According to Clarke's estimate of 1891 phosphorous forms 0.09 per cent of the outer ten miles of the crust of the earth, including the original rocks, hydrosphere, and atmosphere. All of it is in the lithosphere, of which it composes 0.10 per cent. In his estimate of 1900 Clarke reduces this amount to 0.09 per cent.

"Phosphorous is thus twelfth in the scale of abundance, ranking next to carbon, an element of vastly greater importance. Reckoned as an oxide Clarke's estimates of 1891 and 1900 are both 0.22 per cent. This gives phosphorous oxide eleventh place in the table of oxides. In the original rocks phosphorous is known to occur only in the mineral apatite, of which it composes 18.47 per cent. This mineral, while usually subordinate in amount, is very widespread. In the meteorites phosphorous is found in schreibersite (FeNiCoI 3P). (See p. 946.) The amount of $P_2 O_5$ in 78 shales is 0.17 per cent; in 624 sandstones 0.07 per cent; in 345 limestones not used for building purposes is 0.04 per cent, while in 498 limestones used for building purposes it is 0.42 per cent. [672]

"The amount of $P_2 O_5$ in the limestones used for

(Testimony of Fred B. Weeks.)

building purposes rather than the average of all limestones is taken, as probably more nearly representing the average amount of phosphorous in these rocks, since it is well known that in the belt of weathering the phosphorous is leached out.

"Therefore it appears that the amount of $P_2 O_5$ in the shales is about three-fourths of that present in the original rocks; in the sandstones is about one-third; and in the limestones is nearly doubled. If one multiplies the amount of $P_2 O_5$ in each of the sediments by their estimated quantities, and adds them together, we have the following equation:

".17 multiplied by .65 plus .07 multiplied by .30 plus .42 multiplied by .05 equals .1525.

"This shows a deficiency of about one-third of $P_2 O_5$, as compared with the original rocks. A portion of this deficiency is undoubtedly accounted for by the phosphate rock deposits, such as those of South Carolina, Florida, and Tennessee, and by the guano deposits. These represent the economic products of segregating processes which have increased the proportional amount of phosphorous many fold.

"All agree that the first stage of the segregation of phosphates in the sedimentary rocks is accomplished through the agency of animals. For [673] the guanos this first concentration is made by sea birds. For the more extensive phosphate deposits the first concentration of phosphorous was by invertebrate animals, such as brachiopods and crustaceans, and by vertebrates, such as sharks and saurians. Very commonly this first concentration is in lime-

(Testimony of Fred B. Weeks.)

stones. The further concentration of the phosphorous of guanos and that of phosphatic limestones and other rocks is by underground water. The circulations producing the concentration and the forms of the resultant deposits are multifarious, but the general principle applicable to most cases appears to be that the phosphates are dissolved by descending waters in the belt of weathering and thrown down on reaching the belt of cementation. Usually the latter reaction takes place in the upper part of the belt of cementation, so that the phosphates are segregated at or just below the level of ground water. The precipitation of the phosphates is especially likely to occur in limestone. Eldredge suggests that under such circumstances the precipitation is brought about by the simple interchange of bases between the phosphate and carbonate of lime thus brought together, or by the lowering of the solvent power of the waters through loss of carboni*a* acid. The latter would happen whenever the acid was required for the solution of additional carbonate of [674] lime, or when, through aeration, it should escape from the water. The zone of phosphate deposition was apparently one of double concentration, resulting from the removal of the soluble carbonate thus raising the percentage of the less soluble phosphate, and from the acquirement of additional phosphates of lime from the overlying portions of the deposit.

"The precipitated phosphate is likely to be deposited in nodules. This material is more resistant than the containing limestone. Through erosion by

(Testimony of Fred B. Weeks.)

streams or ocean there may be a further concentration of the phosphates due to the greater resistance of the phosphate to both solution and mechanical wear as compared with limestone."

Judge DEY.—Q. Now, Mr. Weeks, does what has been read to you from Professor Van Hise bear a statement to which you concur?

Mr. BUDGE.—We object to the question on the ground that it is improper, involves several propositions—innumerable propositions—and on the ground that it is improper to read into the record at great expense the expressions of opinions such as have been read in this question.

A. There are some statements with which I wholly agree, some of them to which I would make exceptions, and others which I wholly disagree with. I might say that the principal matter considered as to the origin and formation of phosphate deposits, what was [675] read from Professor Van Hise related wholly to phosphate deposits of the Eastern United States, which differ entirely in form and manner of occurrence from the phosphate beds of Western United States, and that if Professor Van Hise had had the opportunity of studying these deposits his generalizations would not have been so sweeping. It would be impossible for me to designate the particular parts with which I agree and disagree, or to which I would make certain exceptions, without taking each and every proposition and considering and answering them separately.

Q. It shows, does it not, or illustrates, does it not,

(Testimony of Fred B. Weeks.)

that there is far from being any concurrence of views upon the subject?

A. No, I don't agree to that statement. I think there is a considerable concurrence of opinion as to the mode of formation of the phosphate deposits which he was considering; but that the phosphates which are here in question are different in a very great many respects from the ones which he was discussing.

Q. Formed at a different time? A. Yes, sir.

Q. Eh? A. Yes, sir.

Q. A different age? A. Yes, sir.

Q. When did you find that out?

A. When I first began the study of phosphate in the West, in 1906.

Q. I notice that in your testimony in the case I have referred to you were applying southern and eastern phosphate [676] deposits to the western deposits.

A. There are certain of the eastern deposits which were formed in the same manner as the western deposits; but the phosphates of North and South Carolina, and the river and land pebble deposits of Florida, were deposited in a wholly different manner.

Q. Exactly.

A. You take the hard rock deposits of Florida, and the Tennessee deposits, the Arkansas deposits, I think they resemble these in a good many respects.

Q. The question I am trying to get an answer to is this: whether or not there are not different theories as to the origin of the phosphate deposits?

(Testimony of Fred B. Weeks.)

A. That is true, because the different beds of phosphate have a different origin and mode of formation. That is the reason that makes the difference in the ideas as to their formation.

Q. Then there is a difference? A. Yes, sir.

Q. Now, would you please state briefly the different theories advanced? You have given yours. Now, I mean in addition to the one that you have gone over—just briefly.

Mr. BUDGE.—Well, do you mean as to this particular deposit, or as to all deposits, Judge, so that the witness will understand just what you want. I don't understand, I am frank to say.

Judge DEY.—I mean generally—of the upper carboniferous age.

A. There are no phosphate deposits of the upper carboniferous age known except what occur in these western states. [677]

Q. Now, are there different theories as to that?

A. No, sir, none that I know of, as to those deposits.

Q. None that you know of? A. No, sir.

Q. These deposits are of comparatively recent discovery? A. Yes, sir.

Q. How many years?

A. I should say about six or seven years since they were first discovered.

Q. Since the first discovery? A. Yes, sir.

Q. Now, these corresponding types that you have referred to in other sections of the United States, is there a difference of opinion as to the origin and

(Testimony of Fred B. Weeks.)

mode of occurrence of those?

A. I don't know of any. In the descriptions of the Tennessee phosphates, which were made by the Geological Survey by Mr. Hayes, I have seen many quotations from that description, and I have never seen anyone who differed with him in any considerable extent. There is a considerable uniformity of opinion, agreeing with him as to the mode of origin of the Tennessee phosphates.

Q. Does the way in which the mineral deposit in question came to occupy its present position, in your opinion, have any bearing upon the question of whether or not it is a lode or vein, and locateable as such? A. Yes, sir.

Q. In what way?— You can state briefly your theory,—does it have a bearing?

A. From the fact that this deposit was laid down upon an [678] ocean bottom, in ocean water; while the materials of a vein are confined within the limits of fissures or cracks or crevices, pre-existing in the earth's crust.

Q. That is the only way it has any bearing?

A. I have described at considerable length what I consider the features of a vein or lode, or the characteristics of a vein or lode, and I do not consider that this bed shows any of those characteristics.

Judge DEY.—I move to strike that out as not responsive, and I ask the witness once more, is there any other—

Mr. BUDGE.—We resist the motion to strike.

Judge DEY.— —importance attached to the way in

(Testimony of Fred B. Weeks.)

which the mineral deposit in question came to occupy its present position, in determining whether it is a lode or placer, except the one just stated by you?

A. The materials forming the phosphate bed came into a position immediately overlying a limestone, and the rock which covers the bed is a limestone. There has been no mineralization along the cracks or crevices of the overlying or underlying limestones, which would make it simulate a vein or deposit; while in a vein or lode the mineral-bearing solutions do penetrate into the walls, or into the surrounding country rock where there are not walls.

Judge DEY.—I am afraid, Mr. Weeks, you do not understand the question. Will the Reporter read it slowly and distinctly?

(Said question was repeated, as follows:)

"Q. Is there any other importance attached [679] to the way in which the mineral deposit in question came to occupy its present position, in determining whether it is a lode or placer, except the one just stated by you?"

A. I don't see how I can answer that question except by stating the way in which the material came into this bed, and the way in which material came into a vein or lode. That is my understanding of the question, and I think I have answered it.

Q. You are not prepared to answer it in any other way, then, or further than you have?

A. It seems to me that I am answering the point of the question, from the way I look at it. I am trying to answer it.

(Testimony of Fred B. Weeks.)

Q. Is there any diversity of opinion upon the question as to the way in which phosphate deposits—phosphorite—came into its present position—that is, the position now found— A. — in this deposit?

Q. Oh, no—generally.

A. Well, as I have said before, there is a difference of opinion because there is a difference in the origin. It originates in different ways.

Q. I am now taking up the question of the way in which it came to occupy its present position, as now found, and I ask you if there is any difference of opinion upon that subject among eminent geologists?

A. No, sir; I don't think there is.

Q. Are not some of the opinions that phosphate came from mineral springs arising from the bottom of fissures? A. I think so.

Q. Hasn't the theory also been put forward that the deposits [680] were formed by a solution of phosphate and lime in carbonic, running from the surface downward into the fissure?

A. I think so. But these theories relate to some specific occurrence, and not as a general proposition covering all phosphates.

Q. Hasn't the theory also been advanced that phosphate beds are formed by phosphatic vapors arising up through the jurassic limestone, and phosphatizing it, and that similar action is going on even at the present time?

A. Yes, sir—as it relates to some specific occurrence—not as a general proposition.

Q. In the United States, taking the phosphate de-

(Testimony of Fred B. Weeks.)

posits that have been found, there is a difference of opinion existing as to the way they came in the form and position in which they are found at various places, is there not? A. No, sir.

Q. Take the origin of the Florida phosphates, is that known? A. Yes, sir.

Q. That is not a puzzling problem to geologists?

A. You might say it was.

Q. Are there different theories about it?

A. The theories may differ in some respects; but as a general proposition they are very much alike.

Q. What are the theories put forth, do you know, other than your own, as stated here?

A. For the hard rock phosphates of Florida, they are considered to be bedded sedimentary strata. The river and pebble deposits may be, and are, derived from the erosion of these hard [681] rock deposits in large part. There are also deposits which are considered to have been formed by the removal of the calcium carbonate in limestone, and leaving in its place the calcium phosphate, in nodular forms.

Q. In the Stony case, is it not the opinion that the phosphate has been deposited in a silicious limestone, replacing the lime? A. I think so.

Q. Another theory is that when the strata were lifted up off the sea level, and subjected to erosion, and the action of percolating waters charged with acids from the soil, the phosphate was leached out and carried to lower levels, where it was redeposited, either in cavities or by replacing limestone, is it not?

A. I presume that is correct.

(Testimony of Fred B. Weeks.)

Q. That is a theory advanced? A. I think so.

Q. You know that Mr. Eldredge advanced two theories, or don't you? A. No, I don't think so.

Q. Do you know who he is?

A. Yes, sir. He is dead now. I knew him when he was alive, very well.

Q. Did he write any works upon the question?

A. Yes, sir; he wrote a paper that was published in the American Mining Institute proceedings, on the Florida phosphates.

Q. Was he a standard authority? A. Yes, sir.

Q. Now, when did you enter the service of the Geological [682] Survey?

A. December 1st, 1890.

Q. 1890? A. Yes, sir.

Q. In what capacity?

A. The first work that I did was in assisting one of the geologists in going over his field-notes, and the preparation of his report upon certain field work which he had done.

Q. Were you an official or clerk?

A. That was official.

Q. What position?

A. Well, my official designation was that of a clerk, but I was doing no clerical work.

Q. Your official designation was a clerk?

A. Yes, sir.

Q. In what particular branch of the service?

A. In the Department of Economic Geology.

Q. And you continued in that position of clerk for how long?

(Testimony of Fred B. Weeks.)

A. I don't remember how long I held that official title.

Q. Well, that work?

A. Clerical work I wasn't doing.

Q. That work which you just described, how long did you continue at that work?

A. Why, that occupied several months—that particular piece of work.

Q. What next?

A. In the summer of 1891 there was held a meeting of the [683] International Congress of Geologists, and Mr. S. F. Emmons, a Geologist of the Survey, was appointed as its Secretary, and I was designated to assist him in all the work which he was carrying on in connection with this Congress, in the preparation of a publication which was entitled "GUIDE TO THE GEOLOGY OF THE ROCKY MOUNTAIN STATES," I think was the title, and for use in connection with this Congress of Geologists; and that occupied the summer of 1891, and the closing up of the affairs of this Congress occupied some time during the fall of 1891.

Q. And did you do bibliographic work?

A. My bibliographic work began in 1892.

Q. And how long did that continue?

A. Until 1907.

Q. Until 1907? A. Yes, sir.

Q. That consisted of making indexes?

A. Yes. It was the reading of the articles, or going over them for the purpose of indexing them under the subject headings to which they related.

(Testimony of Fred B. Weeks.)

Q. Then, that was your principal service from 1892 until 1907? A. No, sir.

Q. Until what time did you say?

A. That was until 1907; but it wasn't my principal duties, it was only a part of them.

Q. Only a part of them? A. Yes, sir.

Q. What portion of the year did you devote to that part of your work? [684]

A. Usually the time from about the first of December until about the first of June, of each year; the balance of the time was in field work.

Q. That is, all of the year except between the first of June and the first of December?

A. Approximately that.

Q. That work you performed at Washington, D. C.? A. Yes, sir.

Q. Did you have any field work before you entered the Government employ?

A. Not to any extent, except what I did myself in studying geological features.

Q. As a student does? A. Yes, sir; as a student.

Q. No other? A. No other.

Q. And what year, while in the employ of the Government, did you first go into the field—what summer?

A. In the summer of 1893, I think it was.

Q. Where did you go?

A. Into what is known as Owens' Valley, in Southeastern California, was the principal work I did.

Q. How long were you there?

A. About three months.

(Testimony of Fred B. Weeks.)

Q. With a party?

A. Yes, sir; I was with the Director of the Geological Survey and myself.

Q. What were your duties? [685]

A. Assisting the Director in the study of the geological formations of the region.

Q. Who was the director?

A. Charles B. Wolcott.

Q. He was there? A. Yes, sir.

Q. At the time? A. Yes, sir.

Q. What was the formation there?

A. Some igneous rocks; mostly Cambrian strata.

Q. And the next year where did you go—the next summer—in 1904?

Mr. BUDGE.—1894?

Judge DEY.—Yes—1894?

A. I think it was the summer of 1894 that we made surveys in the Black Hills, and the Big Horn mountains of Wyoming.

Q. Underground surveys?

A. I went into some of the mines in the Black Hills.

Q. Underground surveys, were they, or not?

A. Yes, sir.

Q. All of the surveys?

A. All the underground work I did was of that nature.

Q. Well, that is all the surveying you did, I understand you? A. Except what I did on the surface.

Q. Was underground surveys?

A. Not all. What I did on the surface, as well as

(Testimony of Fred B. Weeks.)

what I did underground.

Q. How long were you there? [686]

A. In the Black Hills we were about two weeks, or a little over.

Q. What part did you take in surveying?

A. Going from place to place, and determining the geological formations, and collecting fossils in them.

Q. There was a party of you?

A. The Director of the Geological Survey and myself.

Q. The two of you? A. Yes, sir.

Q. Just the two of you?

A. I think that was all at that time up in the Black Hills.

Q. Well, had any preliminary work been done?

A. Oh, there had work been done there before, yes, sir, and since.

Q. I asked preliminary work. You understand that question, don't you?

A. Yes. There was no preliminary work by myself or the Director, no, sir.

Q. Had the preliminary work been prepared at the time the Director went there and you accompanied him? A. No, sir.

Q. How long were you there?

A. I think it was about two weeks.

Q. About two weeks? A. Yes, sir.

Q. That was all you were out that summer?

A. Oh, no.

Q. Where next? [687]

(Testimony of Fred B. Weeks.)

A. In the Big Horn mountains of Wyoming.

Q. What did you do there?

A. Studying the formations of the Big Horn mountains.

Q. With the Director?

A. Yes, sir, and Mr. Henry Gannett.

Q. And every summer season you went out with somebody, did you? A. Yes, sir.

Q. With no exceptions? A. No exceptions.

Q. And did you participate in the Park City survey? A. Only for three or four days.

Q. How many years ago?

A. I can't be certain of the date, but I think it was 1904.

Q. Seven years ago? A. Yes, sir.

Q. Is the report out yet? A. No, sir.

Q. In that survey was investigation made of the phosphate deposit at Park City? A. No, sir.

Q. At that time no investigation had been made in the phosphate deposits of the West? A. No, sir.

Q. By the Geological Survey? A. No, sir.

Q. And when did the Geological Survey first commence making an examination into the Western phosphate deposits? [688]

A. When I made the first examination, in 1906.

Q. In 1906? A. Yes, sir.

Q. Has the report been got out on that?

A. Yes, sir.

Q. When was that gotten up?

A. In the winter of 1906 and 1907. It was published in 1907.

(Testimony of Fred B. Weeks.)

Q. Who were with you?

A. Mr. Ferrier and Mr. Taylor part of the time, and part of the time I was alone.

Q. The same Mr. Ferrier and Mr. Taylor who have been referred to in this hearing as connected with the San Francisco Chemical Company? A. Yes, sir.

Q. So far as the Government was represented, it was by you? A. Yes, sir.

Q. Now, how do you account for it that seven years have passed with no report upon Park City, and that a report upon the examination made in 1906 of the phosphate deposits was issued in 1907?

A. The notes which I made upon the Park City area were turned over to the Geologist who had charge of the doing of the work there, and as they comprised but a few days they were not extensive.

Q. Who was the Geologist? A. Boutwell.

Q. He made up a report? [689] A. Yes, sir.

Q. Eh? A. Yes, sir.

Q. You had no part in the preparation of it?

A. None whatever.

Q. What were you doing at that time?

A. I was at Park City waiting for the Director of the Geological Survey to come there to take a trip together, and during the few days that I was waiting for him I assisted Mr. Boutwell in his work about Park City.

Q. Now, you understand the question? We were speaking in reference to the report on the phosphate deposit? A. Yes, sir.

Q. Eh?

(Testimony of Fred B. Weeks.)

A. That report I was responsible for, and got out immediately.

Q. Oh, you were.

A. The report on the phosphate in 1906, yes, sir.

Q. Oh. That is the question I was really asking you.

A. Yes, sir. I was personally responsible for that, and wrote it.

Q. Who prepared that? A. I did.

Q. Was it issued as a bulletin? A. Yes, sir.

Q. What— What was it?

A. I don't remember the number of the bulletin.

Mr. BUDGE.—315, I think.

WITNESS.—It can be found here. [690]

(Mr. Budge handed a bulletin to the witness.)

Q. And you were alone in that investigation?

WITNESS.—Bulletin 340.

Judge DEY.—Oh—340?

WITNESS.—Yes— No, this is 1907. It is 1906, is the one I want. That is wrong.

(Mr. Budge handed another bulletin to the witness.)

WITNESS.—The 1906 report is Bulletin 315.

Judge DEY.—Well, I had that right?

WITNESS.—Yes, sir.

Q. Did Mr. Ferrier or Mr. Taylor assist you in the making of the report?

A. Mr. Taylor had no connection with the making of the report. I wrote the report in its entirety and forwarded it to Mr. Ferrier by mail, and he made a few additions in connection with the statement in re-

gard to Montpelier; otherwise the material stood as I wrote it.

Q. Was Mr. Ferrier at that time in the service of the Government, in the Geological Department or otherwise? A. No, sir.

Q. Was he connected with the San Francisco Chemical Company? A. Yes, sir.

Q. And also Mr. Taylor, at that time?

A. Yes, sir.

Q. Does his name appear on the report with you?

A. It does. [691]

Q. How long did you spend making the examination in the summer of 1906?

A. I was about ten days actual field work in the fall.

Q. Did you return again? A. Yes, sir, in 1907.

Q. Who was with you?

A. Mr. Ferrier and Mr. Taylor made some trips with me, and part of the time I worked alone.

Q. There were no other persons there connected with the Geological Survey? A. No, sir.

Q. In 1907? A. No, sir.

Q. Did you get up a report? A. I did.

Q. In conjunction or with anyone?

A. No, sir; that report was written alone and published alone.

Q. Was it sent to Mr. Taylor or Mr. Ferrier before it was issued, like you had done the preceding year?

A. It was sent to Mr. Ferrier.

Q. For revision and correction?

(Testimony of Fred B. Weeks.)

A. If he had any. The fact is that he didn't make any.

Q. When you first visited in 1906 the phosphate deposits, your investigation took in what places?

A. Montpelier.

Q. In the Preuss Range?

A. In the Preuss Range, the Raymond Canyon, and Cokeville [692] in the Sublette Range.

Q. Was the ground then located?

A. Yes, sir, in those places.

Q. Both as lodes and placers? A. No, sir.

Q. Eh?

A. No, sir, not in 1906. They were only located as placers, so far as I know.

Q. So far as you know? A. Yes, sir.

Q. In 1907? A. The same condition existed.

Q. Did you return again?

A. Yes, sir, in the summer of 1909.

Q. Of 1909? A. Yes, sir.

Q. While you were in the service of the Government?

A. Yes, sir. I was in the service of the Land Office that summer—the summer of 1909.

Q. You had left the Geological Survey when?

A. In 1908.

Q. In April, 1908, was it? A. Yes, sir.

Q. At that time was litigation pending in this country over the question of lodes and placers, in reference to the phosphate deposits?

A. I don't think there was any litigation pending in 1908.

(Testimony of Fred B. Weeks.)

Q. At the time you left the service?

A. I don't think so. I didn't know of any. **[693]**

Q. When were you first employed in connection with the litigation arising over the question of lode or placer locations applicable to phosphate deposits?

A. In January, 1911, with one exception. During the summer of 1909 I was requested by Judge Richards to come down to Boise to consult with him in regard to the phosphate deposits, as he had some litigation on at that time, and I spent a day with him going over the matter.

Q. Were you then in the service of the Government? A. Yes, sir.

Q. Why did you transfer from the Geological Department to the Interior Department?

A. Well, they were both in the Interior Department.

Q. I should say what branch?

A. The Land Office.

Q. The Land Office branch of the Interior Department?

A. The withdrawals of phosphate land had been made in this area, and the Land Office had the determination of whether phosphate occurred upon or underneath a large number of homesteads and other entries that had been made in this country, and it was necessary that examination should be made and reports made upon those claims before passing upon the title, and as I had done all the work at that time that had been done for the Government upon these phosphate deposits, it was considered advisable that

(Testimony of Fred B. Weeks.)

I should assist the Land Office in their work.

Q. It was not on account of an increase of salary?

A. No, sir.

Q. What was your salary while you were in the employ of the Geological Survey? [694]

A. $2,000.

Q. From the time you went there?

A. Oh, no. No, my salary as $2,000 was from about the year 1901 or 1902, until I resigned.

Q. Until you resigned?

A. Until I resigned, yes, sir.

Q. Now, you resigned from the Government service when?

A. My resignation from the Land Office was written and forwarded to the Land Office in August, 1910; but at that time they asked that that resignation should be held in abeyance until I had made affidavits, or rather depositions, in regard to a large number of coal cases in Wyoming, and the Chief of Division asked me to let that remain in his hands until those had been disposed of, as he wished to have the record show that I was still a mineral expert for the Land Office, and I did so.

Q. And it remained—

A. It remained in his hands without being accepted.

Q. Until when?

A. Until the— I don't remember the date; it was either at the very close of 1910 or the beginning of 1911 that I sent another letter of resignation directly to the Commissioner of the General Land Office.

(Testimony of Fred B. Weeks.)

Q. I don't care about that especially; I just wanted to know when it was.

A. Yes; it was about that time.

Q. I see. Now, prior to August, 1910, when you resigned, had you done any other private service in connection with the phosphate deposits, or litigation arising over lodes or placer questions?

A. Nothing except what I have mentioned in connection [695] with Judge Richards.

Q. One day? A. Yes, sir.

Q. Eh? A. Yes, sir.

Q. You left the active work for the service when you resigned, didn't you?

A. Well, I left active work some months before. I had left on indefinite leave of absence some months prior to August, 1910.

Q. Not in this country? A. No, sir.

Q. Away from the west?

A. I was in the west all the time, yes, sir.

Q. Oh, you were? A. Yes, sir.

Q. What were you doing while on leave of absence?

A. I was in Nevada, working on some lode claims that I had taken in Western Nevada.

Q. Anything in connection with phosphate?

A. No, sir.

Q. In any way? A. No, sir.

Q. Had your services been secured by Judge Richards in the litigation he had?

A. Only for the time I consulted with him.

Q. Which was one day?

(Testimony of Fred B. Weeks.)

A. Yes, sir, and a day or two that it took me to go to and from Boise. [696]

Q. You have frequently discussed this lode or placer question with Mr. Taylor, have you not?

A. Yes, sir.

Q. From the first time you were out there in 1906?

A. I don't think there was any discussion in regard to lode at that time. There might have been. I don't remember.

Q. And in 1907?

A. I presume there had been some discussion in regard to the former case of Mr. Jones, but I don't remember anything definite in regard to it.

Q. Well, in which of the years was the discussion in reference to Mr. Jones' former case?

A. Well, I couldn't say. It might have been 1906 or 1907, or it might have been both.

Q. What was involved in the Jones controversy?

Mr. BUDGE.—We object to that as immaterial and irrelevant and incompetent, and incumbering the record.

A. As I understood, it was the question of lode or placer locations.

Q. That was then in existence?

A. I think the litigation had been settled before that time, I think so, before 1906, if I remember rightly.

Q. Then, you were mistaken a while ago, were you not, when you stated that there had been no—you had known no cases upon the phosphate deposits at the time of your first visit, in 1906?

(Testimony of Fred B. Weeks.)

A. Yes, I think that's right; I had overlooked these Jones locations. [697]

Q. That is what I was getting around at.

A. Yes, I think you are right. I had overlooked that fact.

Q. I would like you to be reasonably sure upon that point, Mr. Weeks.

A. As to whether discussions had taken place between Mr. Taylor—

Q. As to whether there didn't exist both lode and placer locations upon phosphate deposits when you first went there in 1906?

A. Well, as I remember it the litigation had been settled; so that in 1906 there were no lode locations in existence.

Q. There had been? A. There had been.

Q. There had been?

A. There had been, as I understand it.

Q. As you understood it and talked it over?

A. Yes, sir.

Q. Now, do you remember the Bradley property?

A. Yes, sir.

Q. At the time of the first visit? A. 1907.

Q. You don't remember it until 1907?

A. I wasn't there in 1906, no, sir.

Q. But you were there in 1907? A. Yes, sir.

Q. Was the question of lode or placer spoken about as to that property? A. Yes, sir. [698]

Q. By Mr. Jones?

A. No, sir; I never saw Mr. Jones.

Q. Those claims were contested?

(Testimony of Fred B. Weeks.)

A. I understood a contest was—or an objection was entered to an issuance of patent to the Bradley location.

Q. A protest? A. A protest.

Q. And a hearing had? A. Yes, sir.

Q. And they were patented by the Government?

A. Yes, sir.

Q. As lode claims?

A. Yes, sir. I don't know of any hearing being had. I know they were patented as lodes.

Q. Now, in 1909 did you make a report of your investigations?

A. In 1909 I examined about 300 different land entries in the State of Wyoming for the Land Office.

Q. The only question is—

A. And I reported as to each and every one of them as to whether phosphate was upon or underneath such claims.

Q. And that is another number of the Bulletin, is it?

A. No, those were never published; those were simply reports made. And at the end of the season, when I had completed the work, I made a general report to the Commissioner of the General Land Office.

Q. Then, all those reports are not published?

A. No, sir. [699]

Q. Who decides the reports to be published?

A. Usually the—in fact, I suppose, always, the man in charge of the Bureau, like the Director of the Geological Survey, or the Commissioner of the General Land Office.

(Testimony of Fred B. Weeks.)

Q. Did the Director on these trips of his take any other person from the Service with him but you?

A. Occasionally when we were working in the area where some other geologist was working, the geologists of the two parties united for a few days at a time; but no other person was ever called in continuously as an assistant in any of our field work.

Q. Now, will you show me on this yellow exhibit (Defendant's Exhibit 1) where Rock Creek is.

A. It is not noted on the map, but it is about five or six miles east of Sage, Wyoming, which is noted on the map.

Q. What is the scale there?

A. One inch to three miles.

Q. That would be about an inch and a half right east of Sage, as shown on that exhibit?

A. Yes, sir.

Q. When did you make your examination there?

A. I never made any examination of Rock Creek.

Q. Have you been there?

A. No, sir, except as I have gone by it on the railroad. I think I drove along the road by the railroad one time.

Q. The Union Pacific runs along there?

A. The Short Line—the Oregon Short Line.

Q. Oh—from Granger? A. Yes, sir. [700]

Q. So that all you personally know about that is what you have seen from a railroad car, or possibly driving along there? A. Yes, sir.

Q. Who was with you when you drove along?

A. I was alone.

(Testimony of Fred B. Weeks.)

Q. Is there an anticline, or sincline, or monocline?

A. There is an anticline there.

Q. An anticline?

A. Yes, sir. It can be seen from the railroad, or from the wagon road.

Q. And could you see the phosphate outcrop?

A. No, sir.

Q. From the railroad? A. No, sir.

Q. I understood you to say that at that place the dip—the deposit on the dip could be traced for eight miles. Is that right? Do you say that?

A. The question—

Q. Do you say that?

A. No, sir, I don't say that it is so.

Q. How far do you say that at that place the deposit can be traced on its dip?

A. I don't know, of my own knowledge.

Mr. BUDGE.—I think you ought to permit the witness to say what he did say in that connection.

Judge DEY.—Oh, I take it that the record shows what he did say. **[701]**

Mr. BUDGE.—Well, I think it tends to confuse it.

Judge DEY.—I think I will make it perfectly plain.

Mr. BUDGE.—All right.

Q. You were making your statement yesterday from something you had read? A. Yes, sir.

Q. Before? A. Yes, sir.

Q. And you had no reason from any personal investigation of yours to know whether the statement

(Testimony of Fred B. Weeks.)

you made from some other source is correct or not?

A. No, I have no information.

Q. Then, you don't know whether the country is faulted or not? A. No, sir.

Q. I notice that by the yellow exhibit No. 1 that in some instances—that is an illustration at the top there—that in some instances you have drawn two black lines? A. Yes, sir.

Q. Indicating the upper part or surface showing on the deposit?

A. No, sir. The two black lines indicate that there are two different outcrops of the phosphate.

Q. Two different outcrops? A. Yes, sir.

Q. And it indicates that each of them has a different direction of dip? [702]

A. Yes, sir; the directions of dip differ one from the other.

Q. They dip towards each other?

A. Yes, sir; and on the other side of the anticline they dip away from each other.

Q. Where is the other side?

A. It would be to the east—or, to the west—to the east of the east line, and to the west of the west line.

Q. Well, that's all—

A. The center between the two black lines is a sincline; then the beds raise up to an anticline and dip to the east and west on the sides of the anticline. The same is true at Georgetown, where there are two black lines?

Q. Oh, yes—where in part there are two black lines? A. Yes, sir.

(Testimony of Fred B. Weeks.)

Q. Of what importance, in determining the question of the location of these deposits as veins or lodes or otherwise, is it in your opinion, the extent on the dip—the extent thereof on the dip?

A. Taken as a vein or lode, along the strike of the bed, following down upon the dip, the lode locator would have a bed as far as it went on that dip.

Judge DEY.—Now, if you will read the question, Mr. Hamer, to the witness.

(The last question was repeated, as follows:)

"Q. Of what importance, in determining the question of the location of these deposits as veins or lodes or otherwise, is it in your opinion, the extent on the dip—the extent thereof on the dip?

[703]

A. It is important as indicating how much of the bed would be included upon a lode claim.

Q. I ask you in the determination of the question of whether they were lodes or veins or not?

(At the request of the witness said last two questions were repeated, as follows:)

"Q. Of what importance, in determining the question of the location of these deposits as veins or lodes or otherwise, is it in your opinion, the extent on the dip—the extent thereof on the dip?"

"Q. I ask you in the determination of the question of whether they were lodes or veins or not?"

A. I don't know that that is of any particular importance.

Q. You can't think of any? A. No, sir.

(Testimony of Fred B. Weeks.)

Q. In your visit at Park City, you discovered that there were igneous rocks in that district?

A. Yes, sir.

Q. And at other places in this entire section you have covered by the yellow exhibit No. 1?

A. Well, the exhibit No. 1, there are no igneous rocks within the areas which are marked as green. In the areas in which there are no markings, there are some igneous rocks.

Q. Well, the body of it is yellow? A. Yes, sir.

Q. As I see it? [704]

A. Yes; there are in the yellow area some igneous rocks.

Q. There is a hot springs not far from the Montpelier property, isn't there?

A. Yes, sir; near the north end of Bear Lake.

Q. Is there any phosphoric acid in the water?

A. I couldn't say. I never examined it. I don't know that it has been examined for that.

Q. Didn't it occur to you to make an examination for that purpose?

A. No, sir. I visited the hot springs. I didn't consider that they had any relation whatever to the phosphate beds.

Q. How far distant from the phosphate beds shown on Exhibit 2 is that, Mr. Budge?

Mr. BUDGE.—Exhibit 1?

Mr. DEY.—Well, not the yellow one.

Mr. BUDGE.—On this? (Indicating Defendant's Exhibit 2.)

Mr. DEY.—Yes.

(Testimony of Fred B. Weeks.)

Mr. BUDGE.—Exhibit 2?

Mr. DEY.—Exhibit 2.

Mr. BUDGE.—I should say it was 12 to 16 miles in a southerly direction from the Montpelier deposits.

Q. Now, is the spring to the west of the phosphate deposits?

A. At the hot springs locality, it is, yes, sir.

Q. Then the phosphate deposit on its dip would be under these hot springs?

A. Yes; it would be at considerable depth under. [705]

Q. And what does a boiling hot springs indicate to your mind, as a geologist?

A. There must be conditions of extreme heat underneath the surface, with which the hot springs has connection.

Q. That the waters come from below?

A. Yes, sir.

Q. And are forced up? A. Yes, sir.

Q. And go through this bed of phosphate—pass through?

A. I think not, at that locality. I think that between the phosphate bed and the springs there is a fault, which displaces the strata several hundred feet, bringing the phosphate up to the surface; and that if the waters of the hot springs penetrate the phosphate bed it must be at a depth of a few thousand feet.

Q. Yes. What evidence have you found of a fault?

A. The beds are displaced, and the beds which now

(Testimony of Fred B. Weeks.)

occupy the surface upon one side of the fault are of a different character and of a different age than those which are found on the west side of the fault.

Q. Did you mean to be understood as saying that underlying the area of 300 by 500 miles that phosphates would be found—phosphate deposits?

A. Except in those places where it has been brought to the surface and eroded, there would be.

Q. That is your opinion? A. Yes, sir.

Q. That is simply a matter of opinion, isn't it? It has never been demonstrated, has it?

A. Not as a demonstrated fact. It is a conclusion drawn [706] from the observations as you find them.

Q. Your own conclusion, eh?

A. That is what I am passing my opinion on, is my own observations. That is my conclusion, from my own observations.

Q. From your own observations?

A. Yes, sir.

Q. But you will except the hot springs locality?

A. It is underneath the surface there.

Q. I understand that. It is underneath the surface everywhere, except where it outcrops, isn't it?

A. Except where it outcrops, or where it has been eroded.

Q. Then you except the hot springs locality?

A. In what respect do I except it? I don't understand you.

Q. As not containing the deposit of phosphate?

A. The phosphate is there. Simply its position is

(Testimony of Fred B. Weeks.)

changed by this fault.

Q. Now, is there a copper deposit in the locality of Montpelier, or these claims near Montpelier?

A. There are some copper deposits three or four miles east of the Montpelier phosphate beds.

Q. Do you know how that copper got in the form and position it is found there?

A. No, sir.

Q. You don't? A. No, sir.

Q. How does that happen?

A. I haven't made any study of it, for one reason.

[707]

Q. Are you able to say whether it came by metasomatic action? A. No, I could not.

Q. Or leaching? A. No, sir.

Q. Or from ascending or descending waters?

A. No, sir.

Q. Is it found in the sedimentary deposit—formation?

A. I think so, because in passing along the road I have never seen anything but sedimentary deposits in that locality.

Q. Wouldn't the investigation of that have been of interest in the solution of the problem you have been trying to solve up there?

A. Not in relation to the phosphate problem—I don't see that it had any connection.

Q. Was that copper deposit formed before the present uplifting and folding of the country?

A. I couldn't say, for I never examined it.

Q. You don't know anything about it?

(Testimony of Fred B. Weeks.)

A. No, sir.

Q. You have visited the phosphate beds or deposit at Park City, you say? A. No, sir.

Q. You don't know, then, how valuable it is?

A. No, sir.

Q. Or whether it is of any value? A. No, sir.

Q. Some of them are of no commercial value?

A. Yes, sir; a great deal of it is of no commercial value— [708] under present conditions.

Q. It is the combination of phosphoric acid and tricalcic, or lime, that gives it commercial value, is it not? A. Yes, sir.

Q. Without that union or combination these deposits in question would not have a commercial value? A. No, sir.

Q. And that combination of the mineral is in the Encyclopedia Britannica under Phosphorite, is it not?

A. I don't think so. It is the chemical compound of calcium phosphate and phosphoric acid—it should be.

Q. Isn't there such a thing known as metallic phosphorus?

A. I don't know of any such a thing.

Q. You never heard of it?

A. I don't recall it.

Q. I call your attention to the Encyclopedia Britannica, Volume 18, Edition of 1898, page 817, which I wish you would look at, and then answer the question if there is any such a thing known as metallic phosphorus?

(Testimony of Fred B. Weeks.)

(The witness examined the same.)

A. I have never seen this statement before, but—

Q. You find it there, do you? A. Yes, sir.

Q. You find it there? A. Yes, sir.

Q. What is phosphorites?

A. The plural of phosphorite?

Q. Phosphorite?—phosphorite? [709]

A. Why, it is a crystalline variety of the mineral apatite, of fibrous structure, containing chlorine.

Q. I read you this short definition from page 818 of this same work: "Phosphorite is the name given to many impure forms of amorphous or massive apatite, modified more or less by disintegration. It occurs in massive, irregular, corroded looking nodules embedded in limestone or other kind of soft rock, near Amberg."

A. I think that is an absolutely incorrect definition of phosphorite.

Q. You don't understand from your testimony given yesterday phosphorite to mean what I have just read?

A. No, sir, I don't understand it to mean that.

Q. What is phosphor bronze?

A. I don't know.

Q. You have never heard of that, have you?

A. Oh, I have heard it, but I don't know it.

Q. This encyclopedia, at page 817, under that heading, says: "This name has been given to a class of useful metallic substances produced by the chemical union of either pure copper or of copper alloys with phosphorous." That is entirely new to you?

(Testimony of Fred B. Weeks.)

A. I think so. I don't recall it under that name.

Q. I will ask you what is meant by the chemical formula, $P_2O_5$? A. Phosphoric acid.

Q. And what?

A. Phosphoric acid. That is the chemical formula for phosphoric acid. [710]

Q. $P_2O_5$? A. Yes, sir.

Q. That means two parts—

A. —of phosphorous—

Q. —and five of— A. —of oxygen.

Q. Now, you have testified about the uses and the use of this material found in these deposits?

A. Yes, sir.

Q. When did you visit the factories?

A. On June 15th, 1911.

Q. Where? A. At Martinez, California.

Q. Well, whose building?

A. The factory of the San Francisco Chemical Company.

Q. I read you now from page 815 of the same encyclopedia, under the heading, "Manufacture": "For the manufacture of ordinary phosphorous any kind of phosphate of lime might be used, and in fact mineral phosphates are used occasionally." Is that the fact, as you understand it?

A. Yes, sir, as I understand it.

Q. "Although bones are often resorted to"?

A. Yes, sir.

Q. This deposit could be used in that way?

A. I think so.

Q. You really know that, don't you?

(Testimony of Fred B. Weeks.)

(No answer.)

Q. You really know that?

A. That it could be used? [711]

Q. Yes? A. Oh, yes.

Q. Now, the use is in some of the arts and industries, and in the medica materia? A. Yes, sir.

Q. Now, one matter I couldn't understand yesterday, if you will make it clear to me—I am almost through—you made a statement—(if I am not stating it correctly, correct me)—you made a statement to the effect that in the condition it is found it would be more valuable for use as a fertilizer without the treatment at the mill?

A. Under the conditions which I named in my testimony.

Q. Oh—that was limited?

A. Yes, sir, it was limited.

Q. To certain conditions? A. Yes, sir.

Q. We will come to that. Do you know what the price paid for the prepared product of the mill is per ton?

A. I don't know what is paid in California; I know what I have paid for it in the Eastern States.

Q. Do you know whether it is not more than paid for the crude? A. Oh, yes.

Q. Several times more?

A. Well, I couldn't agree to that.

Q. Well, do you know?

A. No, I don't know.

Q. You could not state whether or not it was not four times the price of the crude material? [712]

(Testimony of Fred B. Weeks.)

A. Oh, no.

Q. Now, what was the exception or qualification which you placed upon it—just briefly?

A. That in using the raw rock, the soil should contain a considerable proportion of humus, either naturally or put into it in the shape of manure, or plowing in green manures.

Q. Then, for soil of other descriptions, the other prepared articles would be better? A. Yes, sir.

Q. You were referring to the present use made of phosphates through this territory? A. Yes, sir.

Q. In your testimony yesterday, by that you didn't, I take it, intend to say that no other uses might hereafter be made from that deposit?

A. No, sir, I didn't intend that.

(At this time the witness was temporarily excused.) [713]

[Testimony of C. L. Breger, for Defendant.]

C. L. BREGER, a witness called in behalf of the defendant, being first duly sworn testified as follows, to wit:

Direct Examination.

(By Mr. BUDGE.)

Q. What is your name? A. C. L. Breger.

Q. Where do you reside? A. Chicago, Illinois.

Q. And what is your occupation?

A. I am Associate Editor of the Mining World, a weekly periodical devoted to mining, metallurgy, and allied industries.

Q. How long have you been Assistant Editor—

A. Associate Editor.

(Testimony of C. L. Breger.)

Q. Associate Editor of the Mining World?

A. Since December, 1910.

Q. Prior to December, 1910, in what work were you engaged, Mr. Breger?

A. On the Geological Survey, and—

Q. The United States Geological Survey?

A. The United States Geological Survey.

Q. And for what period of time?

A. Practically from 1903 until I severed my connection with the Survey.

Q. From 1903?

A. Yes; intermittently between 1903 and 1905, and practically continuously since 1905.

Q. Now, covering the entire period of your connection [714] with the United States Geological Survey, what were your duties?

A. My duties with the Geological Survey were to examine the geological structure of the various districts to which I was assigned, with particular reference to delineating rock formations, and particularly by their fossils.

Q. What preparation had you in geology and mineralogy prior to your connection with the Survey?

A. I had studied elementary mineralogy, geology, and physical geography in the boys' high school at Brooklyn, New York, and I took more advanced courses at Cornell University from 1901 until 1906; I took the Summer School of Field Geology in the Helderberg Mountains in Albany County and through Central New York; and during the winter of 1903 and 1094 I was temporarily employed by the Indiana

(Testimony of C. L. Breger.)

Geological Survey, and stationed at Yale—Yale University, in New Haven, Connecticut.

Q. Did you specialize in the study of geology in Cornell?

A. Yes; practically three-fourths of my work was in geology, or geological subjects.

Q. And mineralogy?

A. Not to any great extent.

Q. You took the courses given there?

A. Yes; but I didn't specialize in mineralogy.

Q. Beginning with your service with the Geological Survey, where did you operate—in what part of the United States?

A. In 1903, 1904, 1905, 1906 and 1907—no, I will cut off the 1907—in 1903, 1904, 1905 and 1906 I was in South Central New York, in the areas covered by the Ithaca, Watkins, Elmira, Waverly and Catatouk quadrinals, in South Central New York, and in adjoining portions. [715]

Q. In 1907, 1908, 1909 and 1910 where were you?

A. In 1907 and 1908 I was working in Maine, with a few side trips into New Brunswick.

Q. In 1909 and 1910?

A. In 1909 and 1910 I was in Idaho, Utah and Wyoming, on the phosphate work.

Q. Were you also connected with the Geological Survey at that time? A. Yes.

Q. How long were you engaged in field work in 1909 and 1910, in the phosphate fields?

A. In 1910 I was engaged during all of June, the last week of May, all of June, July, August, Septem-

(Testimony of C. L. Breger.)

ber, and part of October.

Q. What part of 1909? A. That was 1909.

Q. That was in 1909? A. Yes.

Q. In 1910 how long were you engaged in the field work, in the phosphate work?

A. All of July, August and September, or most of September.

Q. Give us in brief a statement of the field covered and visited by you and the area covered by your investigation in the Geological Survey, of the phosphate field in 1909 and 1910.

A. In 1909 I examined personally the phosphate from Georgetown northward to Deer Creek, and beyond Deer Creek.

Q. Where is Deer Creek? **[716]**

A. It is a little canyon at the north end of the ridge coming down from Preuss Peak, about six miles north of Preuss Peak. And I also examined the deposits about Montpelier, extending upward into Gertch Hollow, and Home Canyon, and the geology of the country from Montpelier southward, practically continuously to beyond the south end of Bear Lake, on the east side of Bear Lake Valley; also the geology of the country south and southwest of Bear Lake, although we did not find phosphate in the immediate vicinity of Bear Lake. Then, we examined the phosphate occurrences in Raymond Canyon and northward. I examined the phosphate occurrences in Raymond Canyon and northward, and the geology of the Sublette Mountains as far as a few miles north of Green's Ranch, where the Thomas Fork comes

(Testimony of C. L. Breger.)

down from the east, which is I should say about 15 or 18 miles north of Raymond Canyon. We also examined the geology south of Raymond Canyon, throughout the extent of the Sublette region, as far as Cokeville, Wyoming; and we also examined the geology on the west side of Thomas' Fork Valley, although there was no phosphate occurring there in the carboniferous. The party examined the phosphate—

Q. Were you with it?

A. —at Spine Cup; but I wasn't with it at Spine Cup; but I took up the party again in the Crawford Mountains, where I examined the phosphate and associated geology of the Beckwith Hills, embracing the group of claims owned by the Union Phosphate Company, I believe, and the main part of the phosphate area of the Crawford Mountains, extending from the vicinity of I think it is the Bradley Brothers southward to Rex Peak and a little [717] distance beyond. That is the highest peak of the Sublette Range. Also in 1909 I examined the phosphate and associated geology at Twelve Mile Creek, southwest of Woodruff, Utah.

Q. Now, in 1910 what part of the phosphate area did you cover?

A. Shall I finish answering 1909 first?

Q. Yes—go ahead.

A. In 1909 I was also handed some specimens of phosphate from the divide between Hams Fork and Fontenelle. Those samples I did not myself collect, but received on reliable authority, and they were sub-

(Testimony of C. L. Breger.)

mitted for analyses, and showed over 70% calcium phosphate.

Q. Go ahead and tell us what you did.

A. In 1909 I examined the phosphate and associated geology in Montpelier, in Afton Canyon. We searched for the phosphate in Roney Creek, in the Snake River Range, near Blowout postoffice, but found that the phosphate horizon was there cut out by a fault. I picked up the phosphate in Pine Creek, northeast of Irwin, Idaho, and examined the phosphate and associated geology thereabouts. Also at Teton Pass.

Q. What county in Idaho?

A. I believe it is.

Q. Fremont?

A. I don't know what county it is in, but it is at the south end of the Teton Range, on the pass between Jackson Hole and Teton Basin, including St. Anthony, Driggs, and a lot of towns. Also found the phosphate and examined the phosphate section and associated geology in Moose Canyon, in Coal Canyon,— [718]

Q. Where are these canyons, Mr. Breger?

A. —and Darby Canyon. On the west side of the Teton Range, northeast of the Teton Basin, and traced the phosphate horizon and associated geology from Teton Pass practically as far as the town of Alta, which is on the Idaho-Wyoming line. I also found the phosphate, and examined it and the associated geology, on Phillips Ridge, near Wilson, Wyoming. We next went to Hoback Canyon, south

(Testimony of C. L. Breger.)

of Jackson Hole, and examined the phosphate and associated geology south of Hoback Canyon, and north of Hoback Canyon, including Astoria Mountain and the country around Johnson Creek, or Horse Creek. We also examined the phosphate and associated geology opposite Count's ranch, at the upper head of the Snake River Canyon, two or three miles below Hoback Canyon. This, by the way, is a locality which is indicated on the Land Office plats as a coal prospect, and various localities in the Teton Range were also indicated in old geological survey reports as probably coal prospects, which first attracted our attention to these areas as possible phosphate fields. From Hoback Canyon we passed north into the Grovont—

Q. Is this all in Wyoming, Mr. Breger?

A. All in Wyoming. —Grovont or Grosventre River and Basin, and examined the phosphate and associated geology about the Grovont Canyon, from the vicinity of its mouth up to and along Crystal Creek, a distance I should say of seven or eight miles, and a similar distance up Crystal Creek. Also we examined—I examined the phosphate and associated geology on the west slope of Sheep Mountain, and in the low foothills on the [719] west of the Grovont Range, opening on Jackson Hole. We also examined the associated geology of the Park City beds in the lower buttes—the lower Grovont buttes in Jackson Hole, near the city of Jackson, and found the limestone underlying the phosphate, but the position of the phosphate was there occupied by andesitic

(Testimony of C. L. Breger.)

lava flows, and the phosphate though originally present had been eroded and removed, and its place covered with outflows of lava. From Grovont I examined the phosphate and associated geology along the Buffalo Fork of the Snake River, south of Yellowstone Park, along the North Fork of the Buffalo Fork,—

Judge DEY.—Is the object of this to qualify the witness?

Mr. BUDGE.—Yes, that is one object of it, and another object, I think, is to show the extent of the deposit.

Judge DEY.—Oh.

A. From within a few miles of Yellowstone Park, extending around Black Rock Creek to the pass—to near the pass between Black Rock Creek and Buffalo Fork and the Wind River Basin. I examined the phosphate and associated geology along the head of the Grovont River about Darwin, Wyoming, and between this point and Wells, and along the region of Elk Creek, and a portion of the east slope of the Grovont Mountain range. I also examined the phosphate and geology of the Wind River Range, along the east side of said range, extending from Union north to Lander, a distance of about sixty miles. Along the range the phosphates in the Park City bed are easily and plainly discernible, [720] forming a deep slope along the foothills of the range, visible as a continuous, inclined sheet or plane for a distance of fifteen or twenty miles, as far as the eye could see, along almost in part of the base of the Wind River

(Testimony of C. L. Breger.)

Range. I also examined the phosphate and associated geology north of the Wind River Valley, along the Horse or Pony Creek, near Mr. Brent's ranch, about ten or twelve miles north of Circle, Wyoming. I also examined from the maps the geology of the country in the Owl Creek Mountains, and predicated the existence of phosphate therein, and applied for a special assignment to investigate those deposits, but was refused, and Mr. Blackwelder instead examined these deposits about Thermopolis, and found the phosphate where I had expected it would appear. In 1909 I also examined specimens of the phosphate which had been collected in 1906 and 1907 by the Geological Survey, particularly by Mr. Schultz and by Mr. Smith,—

Q. Which Mr. Smith is it?

A. I don't know his initials. —at Absaroka Ridge, in West Central Wyoming. In 1910 I also examined in the office the specimens of phosphate rock collected by H. S. Gale from near Melrose, southwest of Butte—southerly—from Butte, Montana.

Q. Now, Mr. Breger, what is the approximate length and width of the area covered by you, as you have just detailed it?

A. I can tell that better from a little map.

Q. How is that?

A. I can tell that more accurately from a little map than any guesses I could make.

Q. Well, just approximately. [721]

A. Practically the entire length of the State of Wyoming—the west half of the width; the eastern

(Testimony of C. L. Breger.)

part of the State of Idaho; the southwestern part of the State of Montana; the northeastern part of Utah.

Q. About how many miles one way and another is it?

A. Well, I don't know that, I would just have to guess at it; but I could tell very accurately from the maps.

Q. Well, is it 300 or 400 miles one way or another?

A. All of that; yes, sir.

Q. Which way? A. Both ways.

Judge DEY.—Q. Any way?

Mr. BUDGE.—Q. Any way?

A. Yes.

Q. Now, Mr. Breger, have you examined the phosphate deposits of Montpelier—near Montpelier—and what is known as the Raymond and Francis placer claims of the San Francisco Chemical Company, in Raymond Canyon, at any other time than in 1909?

A. I examined the claims about Montpelier in 1911, in the latter part of June—a few days ago—

Q. A few days ago?

A. A few days ago,—and the Raymond placer claim, north of Montpelier—north of the Raymond Canyon, I believe, and the Francis claim, a few miles south of the Raymond Canyon.

Q. Now, calling your attention to the question of the [722] formation as it exists upon all these claims which are in question in these suits, how does it compare with the formation of the phosphate deposits which you found elsewhere, within this area over which you operated on the Geological Survey?

(Testimony of C. L. Breger.)

A. The phosphate in the Montpelier region and along the west banks of the Sublette Range occurs in the same formation and within the same very limited horizon, and it is an integral and inseparable portion of the entire phosphate field, part of which has been included in the limits within which I have examined it, and so far as there is any separation of the Montpelier or Sublette area from the entire phosphate field this is due entirely to the accident of erosion and the recurrence of intervening mountain ranges with older rocks.

Q. Now, what is the stratification as it is shown, where this phosphate rock is exposed, throughout this region? Tell us what underlies and what overlies it.

Judge DEY.—Do you think it is necessary? Is there any difference between us on that?

Mr. BUDGE.—Well, I don't think there is any particular difference.

Judge DEY.—Well, I just make that suggestion.

Mr. BUDGE.—Q. Well, I will ask you this—I will withdraw that at this time—Did you hear the statement of Mr. Weeks as to the nature of this formation? A. Why, I heard it.

Q. And of the underlying bed and overlying bed?

[723] A. Yes.

Q. Of this phosphate? A. Yes, sir.

Q. And is that practically correct?

A. In its essential features it is correct, throughout the field I have examined it, except with a few differences as to greater or less thicknesses of the

(Testimony of C. L. Breger.)

different members of the Park City formation; but there is throughout, the overlying chert member—the phosphate shale member and underlying limestone—more or less sandy or silicious, locally.

Q. Showing you Defendant's Exhibit 4, would you call that a correct representation or a typical representation of the outcrop of these phosphate beds throughout this entire area?

Q. As to the typical representation, in so far as the phosphate beds are distinctly stratified—distinctly bedded—the main phosphate bed occurs at the base of the shale series overlying the underlying limestone.

Q. Well, this exhibit shows what would—what is a typical showing of what would appear throughout this entire region, if you should take a cross section of the stratification in which these phosphate beds appear?

A. Yes, varying in this one particular; that the limestone band which overlies the main phosphate bed and extends continuously from the region of Georgetown to south of Montpelier, has not been recognized as such elsewhere—which is a minor point.

Q. Well, that is essentially correct, however?

A. Yes, sir. [724]

Q. Throughout this area that you have visited, are there any places where a considerable portion of this valuable bed or underlying bed of phosphate rock appears near the surface, to make it impracticable to mine it underground?

(Testimony of C. L. Breger.)

A. Where I have examined the phosphate along the—wherever the phosphate forms deep slopes—what are known as deep slopes along the surface, there are usually fairly extensive areas in which the phosphate can be quarried, or stripped from the surface; but for the most part the phosphate must be mined as a bed of coal would be mined.

Q. Then, I am to understand you, am I, that the mining of this phosphate would depend in a measure upon the particular locality from which you desire to take the deposit? A. Yes, entirely so.

Q. Have you inspected the workings which have been made upon this deposit in sections of the country in different localities?

A. I have examined the workings which have been made in all the various fields, and have in addition made workings of our own, to lay bare the phosphate bed when there was any question as to its presence in certain areas examined.

Q. Now, where you say these dip slopes occur, and where you say considerable areas would be mined by an open quarry, would it be practicable to mine the phosphate rock in any other manner than by open quarry?

A. It would be impossible.

Q. How long were you upon the ground included within the area shown by Defendant's Exhibit 2 and Plaintiffs' Exhibit 1, when you made your examination in 1911? **[725]**

A. Parts of one day and part of another, in 1911;

(Testimony of C. L. Breger.)

but much of the examination I had previously made in 1909.

Q. In whose company were you, in making the examination in 1911?

A. Part of the time with Mr. Weeks—part of the time with Mr. Weeks and with Mr. Bell, and part of the time with Mr. Taylor.

**Q. Calling your attention to the Defendant's Exhibit 2, I will ask you if when you were upon this ground in 1911—that is, this month—whether you familiarized yourself with the corners and lines of the lode claims shown thereon?**

A. With all the essential corners, yes—not with every individual one.

Q. And with reference to the side lines and end lines of these various lode claims, did you make any examination to determine the position of the outcrop of the deposit?

A. Yes; I went over the ground with that map, and at the important or crucial points I examined the corners and their corresponding indication on the map; also determined whether the outcrop as mapped had been properly mapped, and found it had with one or two exceptions, and those I believe have since been corrected.

Q. Calling your attention to the black line which appears on Defendant's Exhibit 2, I will ask you whether or not from your examination of this outcrop which you made in 1911, whether that black line correctly represents the outcrop as it appears within the boundary lines of the placer and lode

(Testimony of C. L. Breger.)

claims shown thereon?

A. Yes, with one proviso, of course; that the phosphate **[726]** outcrop, as you usually term it, I would rather qualify that, that it does not outcrop everywhere along the point; but this represents the line along which the phosphate bed emerges along the overlying stratum as practically the apex of such line.

Q. In other words, that line represents the highest points on these claims at which phosphate is discernible?

A. Not only that, but also lower points where such phosphate emerges from capping in the canyons and gulches along the dips.

Q. Such as on the Mount Pleasant lode?

A. Such as on the Mount Pleasant lode, and near the Tennessee lode.

Q. Calling your attention particularly to the Arkansas lode and the Mount Pleasant lode, I will ask you to describe the manner in which this phosphate bed is exposed.

A. The phosphate bed is exposed in some tunnels and cuts on the north side of a little gulch south of the Arkansas lode, and within the south line of the Arkansas lode, and follows along the line essentially as indicated on this exhibit, Defendant's Exhibit 2. It does not reach the north end line of the Arkansas lode, which north end line is in the vicinity of a shallow gulch, down which the line of emergence extends into the Mount Pleasant lode. The line of emergence of the phosphate bed then rises on the

(Testimony of C. L. Breger.)

north side of this little gulch to the south side of a deep rocky escarpment formed by the underlying limestone, which is a couple of hundred feet north of the north line of the Arkansas lode. This escarpment is in the underlying limestone, and north of this escarpment; the phosphate does not occur on the southeast side—does not outcrop on the southeast side of Montpelier Creek. [727]

Q. Now, calling your attention— A. Then—

Q. Well, go ahead.

A. Then, from this little rocky escarpment, which holds up the little dip slope, so to speak, of the phosphate, the phosphate bed extends southwesterly along a steep slope within the limits of the Mount Pleasant lode, essentially as indicated on Defendant's Exhibit 2.

Q. Now, is the Arkansas higher or lower than the Mount Pleasant?

A. The Arkansas is higher than the Mount Pleasant lode.

Q. And in which direction does the phosphate bed dip from the Mount Pleasant lode—from the outcrop on the Mount Pleasant?

A. From the outcrop on the Mount Pleasant the phosphate does not dip downward any way.

Q. Which way does it extend?

A. It extends upward.

Q. Towards what claim?

A. Towards the Arkansas.

At this time an adjournment was taken until tomorrow morning at 9:30 o'clock. [728]

(Testimony of C. L. Breger.)

On Friday, the 23d day of June, A. D. 1911, at 9:30 o'clock A. M., the hearing was resumed, pursuant to adjournment.

C. L. BREGER, a witness heretofore called by the defendant and duly sworn, being recalled in behalf of the defendant, testified as follows, to wit:

Direct Examination.

(By Mr. BUDGE.)

Q. From your examination of this phosphate area which you have described, how far on the dip has it been determined that this phosphate bed extends?

A. The phosphate bed extends on the dip as does any coal bed, and even where it plunges beneath the overlying strata, like a coal bed that might be and could be found by boring, and comes out again where the strata are uplifted and reappears on opposite sides of sinclines and at opposite sides of anticlines. It has, in fact, been folded—actually folded on dip slopes, in the north side of the Grovont Range—

Q. In what state, Mr. Breger?

A. In Wyoming, west of Crystal Creek, and between Crystal Creek and Sheep Mountain, the Park City beds, including the phosphate, extends as a continuous slope down the northeast side of Sheep Mountain into the Grovont River, for a distance [729] of about four miles, where they form the surface rocks before they dip under what are known as the Red Beds.

Judge DEY.—I move to strike that out as not responsive to the question asked, and not relevant or pertinent to the ground in question.

(Testimony of C. L. Breger.)

Q. Now, is that— A. There are other cases.

Q. Well, has it been known to dip—to extend on the dip any farther than four miles in any other place? If so, where?

A. Yes; it extends farther than four miles here, because at the distance of the four miles mentioned it is covered by the Red Beds, and when the Red Beds come in the phosphate is then about 400 feet below the surface.

Q. Has that ever been demonstrated?

A. Yes, sir, by stratigraphic geology. Above the phosphate horizon known as the Park City formation there occurs throughout the west a series of beds known as the Woodside and Thayne's formations, which are of Permione and Triassic age.

Q. Well, just limit your answer to the place where it extends and how it has been demonstrated.

A. Yes. The Woodside formation which overlies the Park City is in the region of Jackson Hole and eastward between 150 and 300 feet thick, and is followed by the Red Beds; so that where the Red Beds are observed the phosphate rock is at a corresponding depth, plus from 25 to 75 feet thickness, to include the chert and shales overlying the main phosphate bed. So that at Red Mountain, in the Red Hills north of the Grovont River, **[730]** where the Red Beds first appear, the phosphate is at a depth of less than 400 feet, or about 400 feet, and the dip northwestward is maintained for four or five miles or more still farther.

Q. Beyond the river?

(Testimony of C. L. Breger.)

A. In a continuous direction down from the dip slope. The first four or five miles mentioned down the dip slope represents what is known as a dip slope; that is, the mountain—

Q. Well, never mind that, Mr. Breger. I just want to find out the extent of the deposit on the dip, without these other details in some particular place.

A. It would be eight miles or more at the Grovont.

Q. And has that been demonstrated?

A. Absolutely. Then, in the Wind River Range, on the northeast side of the Wind River Range, and on the southwest side of the Wind River Valley, for a distance of about 90 miles the phosphate forms a continuous slope, which may be traced on the surface. The Park City beds form a continuous dip slope which may be traced on the surface for from half a mile to a mile and a quarter or a mile and a half, beyond which distance—

Q. You mean a mile and a quarter or a mile and a half in width?

A. No—down the dip slope—beyond which distance the overlying Red Beds, in which the strata appear conformably, continue the same northeastward dip. So that along a continuous northeastward dip through a distance of 90 miles or more, the phosphate maintains a uniformly northeastward dip down a distance of seven or eight miles; throughout nearly all of which extent it could be mined and extracted. [731]

Q. Now, Mr. Breger,—

(Testimony of C. L. Breger.)

A. Then, there are also other points; but these are among the most important.

Q. Mr. Breger, are you familiar with the deposits of gypsum? A. Yes.

Q. In what states? A. In New York state.

Q. Any other place?

A. Not that I know of, offhand, now.

Q. How do they occur—these deposits?

A. Deposits of gypsum in New York State, do you mean?

Q. Yes. A. Or gypsum anywhere?

Q. Well, in New York State?

A. The deposits of gypsum of New York State occur as interstratified beds, deposits, and along with the underlying and overlying strata, in a series of gypsiferous shales, in the Silurian, and are overlain by a fossiliferous, hard limestone band, which in New York State is known as the Cobleskil limestone, and in Pennsylvania is known as the bastard limestone.

Q. Now, what is the extent of these deposits there?

A. The gypsum deposits extend throughout the Salina formation as interstratified, bedded, original deposits, from beyond the western boundaries of New York, through Central New York, in an east and west direction, into Albany County; then bend southwestward into Pennsylvania; and from the outcrop in Central New York the beds dip southerly into Pennsylvania; and in central and northwestern points the gypsum beds again emerge [732] in a sincline.

(Testimony of C. L. Breger.)

Q. Now, how do they occur in physical appearance as compared with this phosphate deposit?

A. The gypsum beds of New York resemble very closely in color the phosphate beds, as being black, gypsiferous shales, although the main gypsum beds vary in color from black to creamy pink or white in different parts of the field; but where I examined the gypsum at northeast of Union Springs, at one of the largest gypsum quarrying regions in the State, the gypsum was black, and the gypsiferous shales were black.

Q. Well, has it a dip and a strike?

A. It has a dip and a strike, which is maintained for long distances.

Q. How is it, compared with this phosphate rock?

A. In practically the same way.

Q. And how is it mined?

A. It is mined in open quarries. It is mined for the entire output of the gypsum bed. There is no gange matter with the gypsum, nor is there any metallic mineral or any metal for which the gypsum is mined.

Q. What is it used for?

A. Gypsum is used—in the old days it was used exclusively for what is known as lime plaster, or fertilizer, or manure, and it is now still used largely for that, but to a large extent in the calsomining industries, and as plaster of paris.

Q. Is it used commercially from these quarries for fertilizer purposes? A. Yes. **[733]**

(Testimony of C. L. Breger.)

Q. And is it mined in any other method than by quarries?

A. It happens that in New York State the beds are mined along the outcrop, because such mining is more economical and can compete to better advantage than underground mines. So that all mines are located along the outcrop, and are mined as quarries.

Q. What are the chemical constituents of gypsum?

A. Calcium sulphate. The formula $SO_4$, with some amount of combined matter.

Q. What is the metal base, or has it a metal base?

A. The base of gypsum is calcium.

Q. And the nonmetalliferous mineral is?

A. Sulphur and oxygen.

Q. And what is phosphorite, Mr. Breger?

A. Phosphorite is—was originally a broad and loosely used—has been a broad and loosely used word; but in the origin of the meaning and in the meaning in which it is used by competent and proper authorities, it is—the name phosphorite is applied to a mineral and similar minerals which originally came from the Province of Estremadura and Cacero, in Spain, and similar deposits in Nassau, Western Germany, and in Southern France, all of which are distinctly crystalline minerals; they are not amorphous rock phosphate, or phosphate rock deposits, and as minerals have distinct and uniform chemical composition and physical properties, among the most important of which is a fibrous or radiating structure, and the occurrence of the phosphorite in

(Testimony of C. L. Breger.)

balls varying from the size of a large pea, or hickory nut, to the size of the fist, or in exceptional cases to the size of a cabbage. [734]

Q. I will ask you: Is this calcium phosphate, phosphorite? A. Most decidedly, no.

Q. And in what respects does it differ from phosphorite?

A. In the first place, the phosphate in these deposits is a rock, rather than a true simple mineral such as phosphorite. It lacks the uniform Chlorine content, which is one of the characteristics of phosphorite. It has a concentric oolitic structure, which is distinct from that characteristic of phosphorite; and the geological associations are totally distinct between phosphorite deposits and deposits of phosphate rock, or rock phosphate, such as these in question.

Q. Calling your attention to phosphorite, has it a given density, or gravity? A. Yes.

Q. And in that respect is it distinct from calcium phosphate? A. To a certain extent, yes.

Q. Has it a given luster?

A. The luster varies more or less.

Q. The luster varies more or less—

A. —with phosphorite.

Q. But it is fibrous, you say?

A. It has a distinctly mineral—it is a distinct mineral, one of the most persistent characteristics of which is a fibrous, radiating structure.

Q. Are there any deposits of phosphorite in the United States, known to geologists?

(Testimony of C. L. Breger.)

A. None that have ever been reported by competent authorities. [735]

Q. Do you know of any?

A. I know of none, and I would say there are none so far as anyone knows—so far as known.

Q. In geology? A. Yes.

Q. What definition do you give, Mr. Breger, of mineralized or mineral-bearing rock?

A. Mineralized or mineral-bearing rock is rock in which mineralization has taken place.

Q. Explain in what manner mineralization takes place to constitute the mineralized rock.

A. To constitute the mineralized rock it is necessary to have the rock in place originally, before mineralization takes place. That is necessary to begin with. Thereupon mineralization of the rock may take place by various methods, chief among which are the following: Fissure veins, or vein deposits of a general type of fissure veins, which mineralizations take place in crevices, fissures, or other cavities in such rock, by injection from without of valuable or other materials, usually carried in aqueous solution into such fissures, crevices or cavities. There are also replacement mineralizations, wherein the mineral-bearing solutions, or other mineral carriers, are deposited between the grains of rock in place, and such deposits are usually associated with the replacement of the constituent grains of the rock, to a greater or less extent, by the valuable minerals or mineral-bearing deposits in question. Such deposits are known as replacement deposits, as distinct from

(Testimony of C. L. Breger.)

fissure-vein deposits. There is a third class of deposits, [736] which hardly enters into the present discussion, and is known as magmatic segregations. Such deposits are confined entirely to granites and gneisses and original archaen or primitive rocks which have been molten and mineral depositions separated out to a more or less economical extent from such molten magma.

Q. Is this calcium phosphate a mineral-bearing or mineralized rock? A. Decidedly, no.

Q. Now, in mineralized rock, or mineral-bearing rock, what is the distinction which exists between such rock and this calcium phosphate?

A. In mineralized or mineral-bearing rock, the distinction, perhaps the principal distinction, as I have indicated, is, that to have mineralized rock, the country rock must be in existence—must have been in existence as such prior to the mineralization, and the mineralized or valuable mineral deposits must have been thereafter brought into their present position, and from without the limits of their present occurrence. Those are perhaps the principal distinctions. The phosphate rock was an original sedimentary deposit; it was deposited along with the other strata, below it and above it, to the extent of all the present valuable mineral deposits it bears, and there has been no mineralization or deposition of valuable mineral deposits therein after these rocks have become rock in place.

Q. The mineralized rock that you have described as being fissures, and as appearing by means of re-

(Testimony of C. L. Breger.)

placements, or replacement deposits, are they what you term a vein—veins?

A. Usually; except, perhaps, in the case of petroleum.

Q. What do you call a placer, Mr. Breger? [737]

A. A placer is a valuable deposit of natural mineral or rock, or mineral—or rock-bearing deposits, congregated or aggregated on the surface of the ground, or in bodies of water resting upon the surface of the ground; to which may perhaps be added such deposits congregated or aggregated within loose soil gravel or other detritus resting on the ground.

Q. As a result of your examination of the properties in dispute, these various claims, placer and lode, as well as your examination of and experience with phosphate rock in the western field, and as a result of your experience and training as a geologist, I ask you whether this phosphate rock is a vein or lode of valuable deposits?

A. It is not a vein or lode of valuable deposits.

Q. Well, is it a vein or lode of quartz or other rock in place?

A. It is not a vein of quartz, or of other rock in place.

Q. Is it a vein or lode at all?

A. It is not a vein or lode at all.

Q. Is this phosphate rock or calcium phosphate, rock in place?

A. Yes, as much so and to the same extent as the other beds of limestone, shale and sandstone, constituting the rest of the mountains.

(Testimony of C. L. Breger.)

Q. And does this phosphate rock bear any valuable mineral or ore for which the phosphate is mined?

A. No; it is itself the substance which is—it is itself the mineral or mineral deposit which is in demand.

Q. Similar to what other deposits? [738]

A. In much the same way as, particularly coal, and caolin, and gypsum, salt, limestone, sand, and numerous deposits of a similar nature, which are extracted for the deposits themselves rather than for any valuable materials or substances which can be extracted therefrom.

Q. Mr. Breger, have you ever had any experience in the practical operation of mines?

A. Not to any great extent. I am not a miner; I am a geologist.

Q. You don't represent yourself as a mining man?

A. Not at all.

Q. Simply as a geologist?

A. A geologist, and particularly a stratigrapher.

Q. You have never done any prospecting for valuable minerals?

A. Never, although in geologic work I have come across such deposits.

Cross-examination.

(By Judge DEY.)

Q. What is your age? A. 26.

Q. Are you a professor? A. No, sir.

Q. Are you a miner? A. I am not.

Q. You never followed that business?

(Testimony of C. L. Breger.)

A. I never practiced it. [739]

Q. Or a mining engineer?

A. Not that I have a degree of mining engineer.

Q. Have you any practical experience as a mining engineer?

A. So far as it includes the study of mineral deposits.

Q. Practical, I say.

A. Practical? No, sir; excepting in so far as such studies are practical—studies pursued by other mining engineers.

Q. You are an editor and geologist, then?

A. An associate editor of an important mining journal.

Q. And a geologist? A. And a geologist.

Q. How long have you been a geologist?

A. As a professional geologist, my experiences began with 1903; but I have studied geology before.

Q. Then when you were nineteen years old you became a geologist? A. Yes, sir.

Q. A professional geologist?

A. Yes, sir, and published a report for the Indiana Geological Survey.

Q. That entitled you to become a professional geologist, did it? A. Yes, sir.

Q. What report did you refer to?

A. A report on the stratigraphy and fossils of the Niagara bed of Northern Indiana, published by the Indiana Geological Survey early in 1904, with E. M. Kimball.

Q. Are you Mr. Carpel Leventhal Breger?

(Testimony of C. L. Breger.)

A. Yes, sir. [740]

Q. And at what age did you enter with the Geological Survey Department? A. At Washington?

Q. I don't care.

A. I was employed in connection with the work being undertaken by the Geological Survey at the age of nineteen.

Q. Prior to that time you had finished your education?

A. I should have said at the age of eighteen—

Q. Eighteen? A. —No, sir.

Q. Up to that time had you been to school?

A. Yes, sir.

Q. What school? A. The Cornell University.

Q. Graduated? A. Yes, sir.

Q. At eighteen?

A. No, sir; I graduated from Cornell University thereafter.

Q. Oh. I said up to that time had you graduated at Cornell?

A. I didn't understand the question in that way.

Q. Well, just answer the question.

A. At that time I had not.

Q. What year did you graduate?

A. I graduated in February, 1906.

Q. In 1906? A. Yes, sir.

Q. As what? [741]

A. As Bachelor of Arts, taking a course in science which would have entitled me to a degree of Bachelor of Science had that degree been maintained. It had been abolished a few years previous to my en-

(Testimony of C. L. Breger.)

tering the University.

Q. Seven years, however, before your graduation you became in your opinion a professional geologist?

A. Did you say "seven" or "several"?

Q. "Seven"? A. "Seven"?

Q. Yes. A. No, sir.

Q. 19 from 26—

A. I became a professional geologist in 1903, but I graduated in 1906.

Q. That is three years? A. Three years.

Q. Have you ever lived in the west?

A. Not except in connection with my field work.

Q. Which covered how many seasons?

A. 1910 and 1911—or, 1909 and 1910, and a few days in 1911.

Q. 1909 was the first year? A. Yes, sir.

Q. Who was with you in the west during 1909?

A. H. S. Gale, R. W. Richards, William Waggaman, comprised the official party, along with a cook and teamster, and a visit of a month with Dr. Girty.

Q. How many months was this party in the Rocky Mountains? [742] A. June, July,—

Q. How many, I say? A. I will have to count—

Q. I didn't ask what they were, but how many?

A. Five months.

Q. Five months? A. Yes, sir.

Q. And who was in charge of the party?

A. H. S. Gale was then Administrator in charge of the party.

Q. During that year of 1909 you investigated the question of saline lands? A. For a few days.

(Testimony of C. L. Breger.)

Q. For a few days? A. Yes, sir.

Q. Covering what country?

A. The region about Crow Creek, and the Idaho-Wyoming border in the vicinity of Star Valley.

Q. Now, "a few days"—what do you mean by that? A. It may have been a week or ten days.

Q. Did you prepare a report? A. Yes, sir.

Q. Found at pages 555 to 569 of Bulletin 430?

A. I don't remember.

Q. Well, see if that is right. (Exhibiting said Bulletin to the witness, who examined the same.)

A. Yes, pages 555 to 569, inclusive, Bulletin 430.

Q. Entitled: "The Salt Resources of the Idaho-Wyoming Border, with Notes on Geology"? [743]

A. I guess that's the title, as near as I can remember it.

Q. That you were able to do within a week or ten days' investigation? A. Yes, sir.

Q. Did Mr. Gale or Mr. Richards, to whom you referred, make a report? A. On the phosphates?

Q. On the work that summer? A. Yes, sir.

Q. On what deposits?

A. On the deposits embracing those in Georgetown Canyon.

Q. Well, of what class of deposits?

A. The phosphate deposits.

Q. You didn't participate in that?

A. Yes, sir, I did.

Q. You did?

A. Although my name doesn't appear among the authors.

(Testimony of C. L. Breger.)

Q. But you really wrote it, did you?

A. I didn't write it, no, sir. I participated in the drawing up of a report, and in writing it in part.

Q. You participated, in other words, in the preparation? A. Yes, sir.

Q. Have you a copy of that?

A. Have I the report?

Q. Have you that report? What is the number of it? Oh, I have it here.

A. I think it is part of Bulletin 430, isn't it?

Q. I hand you 430H, and ask you if that is the official Government report? [744]

(Exhibiting said Bulletin to the witness, who examined the same.)

A. Yes, sir.

Q. You assisted in collecting the data that came in this report? A. Yes, sir, most of it.

Q. Handing you this Bulletin 430H, and calling your attention to the bottom of page 42, and the first table on page 43; that is part of the report, is it not? A. That is part of the report, yes, sir.

Q. Made up from the investigations and examinations, etc., in the year 1909? A. Yes, sir.

Q. That summer? A. Yes, sir.

Q. And that refers to the beds of phosphate at Hot Springs, Idaho? A. Yes, sir.

Q. This same country? A. Yes, sir.

Q. That these are found in? A. Yes, sir.

Judge DEY.—I offer in evidence the portion commencing with the words, "the following is a complete section, together with the analytical tests made of the

beds exposed underground in the cross-cut adjoining the entry tunnels. It was made at the time of the examination of this property, September, 1909." From that on down, as follows: **[745]**

## PHOSPHATE DEPOSITS IN IDAHO, WYOMING AND UTAH.

### Section of Phosphate and Associated Beds at Hot Springs, Idaho.

| Field No. of Specimen. | | $P_2O_5$. | Equivalent to $Ca_3(PO_4)_2$. | Thickness. | |
|---|---|---|---|---|---|
| | | Per cent. | Per cent. | Ft. | In. |
| | Limestone, compact, hard.... | .... | .... | 10+ | |
| 141–A | Shale, brown, earthy, calcareous..... ..... ..... | 9.0 | 19.7 | 1 | 6 |
| 141–B | Shale, earthy, massive,..... | 2.0 | 4.4 | 2 | 8 |
| 141–C | Phosphate, oolitic, massive, dark gray..... ..... ..... | 32.8 | 71.8 | 2 | 2 |
| | Limestone, massive stratum... | .... | .... | 2 | 2 |
| 111–D | Phosphate, medium to coarsely oolitic, dark gray..... | 32.3 | 70.7 | | 11 |
| 141–E | Shale, brownish, earthy, calcareous.... ..... ..... | 3.5 | 7.7 | 1 | |
| 141–F | Phosphate, medium grained, oolitic, dark gray,..... | 36.3 | 79.5 | 1 | 3 |
| 141–G | Phosphate: (a) Shale, calcareous,....5 (b) Phosphate, oolitic, brownish.. ..... 4 (c) Shale, brownish, phosphatic.. .... 2 (d) Shale, brownish, phosphatic .....11 | 27.5 | 60.2 | 1 | 10 |
| 141–H | Phosphate, medium to coarse grained, oolitic (main entry tunnel)..... ..... | 29.1 | 63.7 | 5 | 10 |
| 141–I | Phosphate, medium to coarse grained, including pebbly texture,..... ..... .... | 28.0 | 61.3 | 1 | 5 |
| 141–K | Shale, phosphatic, dark brown, earthy,..... ..... ..... | 24.3 | 53.2 | 11 | |
| | Limestone..... ..... .... | .... | .... | 1 | |
| 141–L | Shale, phosphate, dark brown, earthy,..... ..... ..... | 12.9 | 28.3+ | 10 | 6 |
| | Shale, phosphate, dark brown, earthy..... ..... ..... | .... | .... | 4 | 11 |
| [746] | | | | | |
| 141–M | Shale, phosphatic, somewhat oolitic.... ..... .... | 20.3 | 44.5 | 1 | 8 |
| 141–N | Shale, phosphatic, dark brown, earthy.... ..... ..... | 5.2 | 11.4 | 4 | 6 |
| | | | | 64 | 4 |

(Testimony of C. L. Breger.)

Judge DEY.—I call your attention to page 47, in reference to Raymond Canyon, in the Sublette Range.

Q. That is also part of that investigation and report that you participated in?

A. Yes, sir, with this qualification: that I did not personally collect those samples or make those detailed sections specifically described in these extracts.

Q. It was done in the regular Government—in the regular course of service?

A. Oh, yes—by the party.

Q. By the party, and you didn't do all of it?

A. Oh, no.

Q. That I understand.

A. In fact, that particular work, I didn't do any of that.

Q. That is at the place where these Wyoming claims in controversy are?

A. This place here? (Indicating in said book.)

Q. Yes—the same deposit, anyway?

A. It is a continuation of the same deposit.

Q. A continuation of the same deposit?

A. Yes, sir.

Q. As a matter of fact, is it not from the very property involved in these actions— [747]

A. I will have to look at that.

Q. —that are in Wyoming?

(Submitting said extract from said pamphlet or bulletin to the witness, who examined it.)

A. No, sir, I think these are not the property in dispute.

(Testimony of C. L. Breger.)

Q. Well, let's get the exhibits. Calling your attention to exhibits "A" and "B," can you locate the place shown in that part of the book?

A. Yes. The portion described here is mentioned as being in Raymond Canyon, and Raymond Canyon is a couple of hundred yards at least south of a little gulch which extends along the south edge of the Raymond placer mining claim.

Q. It mentions the tunnel, does it not, in Raymond Canyon?

A. Such tunnels exist, I believe, on the south side of the Raymond Canyon, which is without the limits of the Raymond placer claim and the Japan.

Q. And doesn't extend under them?

A. Not that I am aware of. In fact, these tunnels from which the samples were collected, as near as I can remember, were on the south side of Raymond Canyon.

Q. In a southerly direction? A. I believe so.

Q. Are you sure about that?

A. I don't remember offhand now.

Q. Well, it would be the same, anyway?

A. A continuation of the same deposit, yes.

Judge DEY.—We now read in evidence the following from said bulletin:

> "Raymond Canyon cuts the Sublette Range in a [748] steep, narrow, and rocky gorge traverse to the trend of the range and to the major axes of folding in the strata. The phosphate beds are exposed by prospecting in the NW. ¼ NE. ¼, sec. 6, T. 26 N., R. 119 W., by entry tun-

(Testimony of C. L. Breger.)

nels through the slide rock on the south side of the canyon. The cherty limestone forms a most prominent exposure in the canyon, standing nearly vertical like a massive rock wall about 80 feet thick, through which the creek passes in a gap hardly wider than the creek channel and the wagon road. The phosphate bed exposed in the principal prospects occurs high in the shaly division of the Park City formation, being relatively much nearer the cherty ledge than is the principal bed of the Montpelier section.

"The following section was measured and samples were collected at the Raymond Canyon prospects:

"Partial Section of Phosphatic Beds in Raymond Canyon, Wyoming.

| Field No. of Specimen. | | $P_2O_5$. | Equivalent to $Ca_3(PO_4)_2$. | Thickness. | |
|---|---|---|---|---|---|
| | | Per cent. | Per cent. | Ft. | In. |
| 42–A | Shale, grayish brown..... | 8.9 | 19.5 | 4 | 5 |
| | Limestone..... ..... .... | .... | .... | 6 | |
| 42–B | Phosphate, massive, compact, black, oolitic ..... ..... | 32.0 | 70.1 | 3 | 1 |
| 42–C | Limestone, dark, fine grained.. | 9.3 | 20.4 | 5 | |
| | | | | 18 | 6 |

[749]

Q. Referring to this table, it says: "The following section was measured and samples were collected at the Raymond Canyon prospects:" Does that refresh your recollection?

A. Why, not so far as I can understand that—I didn't write this particular paragraph. This would mean prospects in Raymond Canyon.

(Testimony of C. L. Breger.)

Q. Well, that is all called Raymond Canyon—that vicinity—isn't it?

A. Why, no, sir, there is a Coal Canyon and Francis Canyon.

Q. Well, I say, that immediate vicinity of Raymond Canyon? A. Not that I know of.

Q. I hand you this same bulletin. Calling your attention particularly to the last paragraph on page 10 and the table at the top of page 11; that was the result of the examination made by the party just referred to? A. No, sir.

Q. Eh? A. No, sir.

Q. The analyses were made by the Government at Washington?

A. Yes, sir, but not by any member of the party. The other analyses of the party were made in the field by Mr. Waggaman.

Q. But the material for the analyses was collected by the party? A. Yes, sir.

Q. And taken to Washington?

A. Yes, sir, and analyzed in the laboratory at Washington.

Q. And analyzed in the laboratories at Washington? A. Yes, sir. [750]

Q. By Mr. Steiger?

A. Yes, sir, who was a chemist of the Geological Survey, at Washington.

Q. Within this table is comprehended the Preuss Range—the deposits found in the Preuss Range—eight miles east of Georgetown, Idaho?

A. Yes, sir, it is in Georgetown Canyon.

(Testimony of C. L. Breger.)

Q. The same range of mountains?

A. The same range, yes.

Judge DEY.—We now read in evidence the following from said bulletin:

"The following more complete analyses of phosphate rock from these fields were made by George Steiger in the laboratory of the United States Geological Survey: [751]

Analyses of Phosphate Rock from Wyoming, Utah and Idaho.

| | 1. | 2. | 3. | 4. |
|---|---|---|---|---|
| Insoluble | 10.00 | 1.82 | 9.40 | 2.62 |
| $SiO_2$ | None. | .30 | Not det. | .46 |
| $Al_2O_3$ | .89 | .50 | .90 | .97 |
| $Fe_2O_3$ | .73 | .26 | .33 | .40 |
| MgO | .28 | .22 | .26 | .35 |
| CaO | 45.34 | 50.97 | 46.80 | 48.91 |
| $Na_2O$ | 1.10 | 2.00 | 2.08 | .97 |
| $K_2O$ | .48 | .47 | .58 | .34 |
| $H_2O$ | 1.04 | .48 | .61 | 1.02 |
| $H_2O+$ | 1.14 | .57 | .75 | 1.34 |
| $TiO_2$ | None | None | None | None |
| $CO_2$ | 6.00 | 1.72 | 2.14 | 2.42 |
| $P_2O_5$ | 27.32 | 36.35 | 32.05 | 33.61 |
| $SO_3$ | 1.59 | 2.98 | 2.34 | 2.16 |
| F | .60 | .40 | .66 | .40 |
| Cl | Trace. | Trace. | Trace. | Trace. |
| Organic matter | Not det. | Not det. | Not det. | Not det. |
| | 96.51 | 99.04 | 98.90 | 95.97 |

1. Main phosphate bed, 2½ miles east of Cokeville, Wyo.
2. Dunnellon claim, Crawford Mountains, Utah.
3. Elsinore claim, Tunnel Hollow, between Morgan and Devil's Slide, Utah.
4. Preuss Range, 8 miles east of Georgetown, Idaho.

[752]

Q. I call your attention to page 7 of this report and bulletin of the Government, and under the head-

(Testimony of C. L. Breger.)

ing "Source of Phosphoric Acid," it is stated: "An entirely satisfactory explanation has not yet been given of the source or manner of accumulation of the phosphoric acid," is it not?

A. Yes, it is so stated there. I would lay emphasis on that, if I may, that at the time—

Q. Well, never mind. Your counsel will ask you if there is anything to emphasize—after a while. I next call your attention to the following, found on page 22 of this report, where it is said: "The occurrence of rounded or oval limestone nodules, ranging from a few inches to several feet in diameter, is a characteristic feature in the phosphate beds and the phosphatic shales. They consist of very dense, compact, fine grained limestone, having a foetid odor when struck with a hammer, but showing a low percentage of phosphoric acid wherever tested, as all the dense, fine-grained limestones tested we found to run very low in phosphoric acid, tests of these rocks were abandoned in the latter part of the season's work." That is the fact, as the examination of your party up there showed that summer?

A. No, sir.

Q. Eh? A. No, sir.

Q. Is it not?

A. Except "The occurrence of rounded or oval limestone nodules, ranging from a few inches to several feet in diameter, is a characteristic feature in the phosphate beds and the phosphatic shales" should be modified to mean the phosphatic beds [753] and all the phosphatic shales other than the principal

(Testimony of C. L. Breger.)

phosphate beds.

Q. Why didn't you modify it when you went over this report?

A. I didn't write that; and besides, that is a very minor and technical point, that there were so many divergent—

Q. You assisted, you stated, in the preparation of the work, and in the preparation of this report?

A. Yes, sir.

Q. And now you want to qualify it?

A. I have no responsibility for that report myself. My name does not appear in the authors.

Q. Did you suggest it being changed at the time?

A. No, sir; the point didn't occur to me at the time.

Q. Oh. When did it occur to you?

A. It has since occurred to me.

Q. Who brought it to your attention?

A. Nobody that I know of, except that I don't remember in my experience the year before (1909 or 1910) having seen any phosphate nodules in the main bed.

Q. Did you talk it over with Mr. Weeks?

A. No, sir.

Q. Not a word?

A. Not a word with Mr. Weeks.

Q. Who with? A. Nobody that I know of.

Q. Nobody that you know of? A. No, sir.

Q. When did it occur to you, recently? [754]

A. When did it occur to me?

Q. Yes—recently.

A. I don't know that I can point out any moment

(Testimony of C. L. Breger.)

that it occurred to me.

Q. Since you came here to Pocatello?

A. No, sir.

Q. While you were in Chicago?

A. Well, I don't know that; it may have been in Washington or on the train to Chicago; or it might have been in the fall of 1909 or 1910.

Q. Oh—I thought you said recently.

A. Well, that is, after the close of the field season, yes, in 1909; or it may have occurred to me then to mark the wording there, to make that statement true, in that limestone nodules are found in the phosphate beds and phosphate shales.

Q. You have gone over this report, recently, have you? A. Over the whole report?

Q. Yes.

A. Oh, I have glanced at the parts you have shown me, and I have rambled through parts of it.

Q. Is there any other part of it, after your examination of the report, that you want to change?

A. Not without reading and studying the whole report.

Q. That you think of now?

A. Excepting the point you just mentioned now, as to an entirely satisfactory explanation having yet been brought out. Of course, there was inserted the words, "entirely satisfactory"; and besides, that was written in 1909.

Q. That is, the work was done in 1909— [755]

A. And the report was written—

Q. —less than two years ago?

(Testimony of C. L. Breger.)

A. I think it was entirely completed over two years ago.

Q. Before the first of July?

A. Yes, sir; it was completed before the field season—completed, I should think, along about in April —I think in April or March, it was practically completed in March, and some illustrations I think completed in April.

Q. Did you examine the field in the winter, after the snow—

A. No; the report was written up in the fall and winter, in Washington.

Q. Well, that would be the winter following the summer of your examination?

A. Oh—pardon me.

Q. In 1909?

A. Oh, yes, in 1910—pardon me; I was thinking that was 1909.

Q. So this report was prepared a little over a year ago?

A. A little over a year ago. I was thinking of 1909 all the time.

Q. Now, during that year it has become more certain to you, has it?

A. The phosphates have been more extensively studied by the Geological Survey and others.

Q. And consequently, it is a very deep study, is it not?

A. Well, that would depend on what you mean by "very deep."

Q. Well, I mean a complicated study? [756]

(Testimony of C. L. Breger.)

A. Well, to the layman as much so as any technical work in any profession would appear.

Q. Exactly—to anybody, perhaps, except the young graduate?

A. Oh, no, not at all, no, sir—to a prospector, or a miner, or a geologist, whether he was young or otherwise.

Q. On page 33 I find this:

> "Enrichment may have been due in part to a secondary replacement of lime by phosphoric acid; but in most weathered exposures it seems to be largely the result of leaching of the more readily soluble lime, the proportion of the residual phosphates being thereby increased."

That is correct, is it?

A. I wouldn't say that.

Q. As I have read it?

A. I would like to read it and see what it refers to.

Q. You certainly can.

(The witness read the same.)

A. This "enrichment" refers to a preceding sentence, in which it says that the exposures from which these samples were taken were near the surface of the ground, the strata standing in nearly a vertical position, and all were more or less weathered and of earthy composition, a factor which is generally understood to enrich the phosphatic content.

(Testimony of C. L. Breger.)

Q. On page 54 I find the following in this report:

"In a hasty review of the area southwest of Cokeville, a piece of rock picked up at the monument of [757] the quarter section corner on the west side of Section 36, T. 24 N., R. 120 W., Wyoming, was found on test to be rock phosphate, equivalent to about 70% bone phosphate grade. This rock was collected with a number of other specimens from oolitic limestone of the Twin Creek formation, such as is observed in many places throughout the Idaho, Wyoming and Utah field. Most of the dark bluish oolitic limestone specimens, many of which represented rock in place, proved to contain but a negligible trace of phosphoric acid. This specimen of commercial phosphate was derived from float, and being of angular form had probably not been transported far. This phosphate, which resembles the oolitic jurassic beds found in natural outcrop nearby, is thought to have been derived from this portion of the formation. No outcrop of the older or carboniferous phosphates are now known nearer than those of the Cokeville mines, a distance of more than six miles."

A. Would you mind including the next sentence?

Q. Not at all. You may read the next sentence.

A. "The Twin Creek phosphate beds had not, however, been found in place." I would qualify that. In the season of 1910, in Hoback Canyon, which is about 85 miles east of north of Cokeville, I collected from apparently this same oolitic horizon

(Testimony of C. L. Breger.)

in the Twin Creek, samples which were sent to Washington, and word was sent back that they contained 60% phosphate.

Q. Well, wait a minute. Was the word sent back by letter? [758] A. By telegram.

Q. By telegram? A. Yes, sir.

Q. Have you the telegram?

A. I have not. That is not my property, of course. Well, I want to continue that.

Q. Well, I want the best evidence.

A. Well, that may be brought up in what I am about to say. On returning to Washington, and comparing the laboratory numbers of the specimens submitted and the laboratory records of the phosphate contained in these samples, I found that the record showed only a trace of phosphoric acid, in the chemical analyses of those samples. So that the entire matter of "jurassic" possibly was wholly in the air.

Q. Like a great many other things connected with the matter? A. Not a great many.

Q. Quite a good many?

A. Well, I should prefer to have those pointed out to me before I commit myself.

Q. On page 63 I find the following:

> "The most massive or less shaly material and that most coarsely oolitic is considered the best ore. The rock of the workable bed is dark gray when freshly taken out, drying to a light gray in the air. It is of fine to medium and in part coarsely oolitic texture, and shows both massive

(Testimony of C. L. Breger.)

and shaly structures."

A. May I refer back to what that refers to? [759]

Q. Sure.

A. Yes. This word "ore" here is used in a general and very loose sense, and not at all in a technical sense; besides which, I remember that this statement was given to us by some of the men on the ground. The fact that the miners consider the shaly material, or the most coarsely oolitic, the best ore, is not determined primarily by the geologists, but they took the word of the men there, and there was nothing to contradict that. The word "ore," as a matter of fact, is used very loosely there.

Q. In other words, from the scientific or geological use of the word, you would not use it here?

A. Oh, most emphatically no.

Q. But from the ordinary miner's standpoint they used it— A. No, sir.

Q. —and consequently you used it in this report? Is that it?

A. No, sir, not from the ordinary miner's standpoint.

Q. Oh—what kind of a miner?

A. Those particular men at the mines in the Crawford Mountains, who, you understand, were farmers from the Woodruff Valley.

Q. They were mining?

A. That didn't make them miners.

Q. Did it make them farmers?

A. They had been farmers.

(Testimony of C. L. Breger.)

Q. How do you know?

A. I understand that. In fact, I don't know.

Q. Oh, you understand it?

A. Yes; that is what I have been given to understand by **[760]** Gale and Richards. I didn't examine those mines in detail myself.

Q. Well, when you come west and see so many miners, you size them up as farmers; is that right?

A. Why, not at all.

Q. That was your first trip west?

A. Why, that was, yes.

Q. Did Mr. Taylor, of the San Francisco Chemical Company, furnish any of the data for this report of that season?

A. Not that I know of, except that he furnished us with mine maps and every facility to investigate the deposits about Montpelier; but he had no part in writing the report; but there was a report submitted to him.

Q. But for information that is contained in the report?

A. Well, I don't know, without reading, whether he did furnish any information that was embodied bodily in that report.

Q. Well, you know, do you not, that he called it "ore"? A. I don't know that.

Q. You never heard him call it anything?

A. I never heard him call it what?

Q. Anything?

A. I have heard him call it phosphate rock.

Q. At that time?

(Testimony of C. L. Breger.)

A. When are you referring to?

Q. At the time this examination on which this report was based was made? A. Oh, yes.

Q. Did anyone else connected with the San Francisco Chemical Company furnish any information to the party, to enable the [761] preparation of this report or bulletin?

A. As near as I can remember I should say no, except in so far as the employees of the company assisted us in examining the property and offered us every facility to examine those properties.

Q. These farmers?

A. I think Mr. Groo was about the only man who was connected with showing us about the property, and showing us the workings, and he was a miner.

Q. Among other considerations entering into this report I find the following on page 77, under the heading of "Availability of Low Grade Phosphates," from which I read you:

> "In the tonnage summaries of the several districts a number of references have been made to the feasibility of future use of the low-grade phosphate-bearing rocks, and a statement in review of the entire field may serve to emphasize the importance of this phase of the subject. Throughout the areas covered by the present tonnage estimates of high-grade rock the phosphatic portion of the Park City formation contains in addition at least 40% of phosphatic shales, averaging perhaps 18% of P205, equivalent to about 40% of $Ca_3 (PO_4)_2$. Or, in round numbers, to

(Testimony of C. L. Breger.)

a billion tons of low-grade rock."

A. Yes—of low-grade rock.

Q. Is there any explanation you desire to make, or does that sufficiently speak for itself?

A. I think that is correct. Mr. Gale wrote that report; **[762]** but the entire matter of the feasibility of using low-grade raw phosphate was suggested by myself, and Mr. Gale and I discussed that problem, and Mr Gale wrote the report.

A. The use referred to there is as crushed raw rock, untreated, such as what is known as the Liege phosphate, in Belgium and France, which will average between perhaps 30 and 40% tricalcic phosphate; and the low-grade phosphate rock of Central Russia, of about the same composition.

Q. Well, did you write that portion that I read?

A. I did not write those words, no, sir.

Q. I understand Mr. Gale wrote that?

A. Mr. Gale wrote that; but Mr. Gale and I discussed that, and I suggested the feasibility of the use of the low-grade raw rock.

Q. You suggested that? A. Yes, sir.

Q. In other words, bringing in all as a body to commercial value? A. Yes, sir, as raw manure.

Judge DEY.—I move to strike out "as of raw manure," as voluntary, and not called for.

Q. Will you please step up here to Defendant's Exhibit 2. Referring to the black line, I understood you to say on direct examination that you checked it up on the ground?

A. In the important and essential points.

(Testimony of C. L. Breger.)

Q. Did you not say "in the important and crucial" points?

A. Not that I remember of—possibly I did.

Q. Possibly you did?

A. But that would show. **[763]**

Q. Now, where are the crucial points?

A. I saw the discovery stake on the Maury lode, and the stakes 6 and 9, 25 feet distant from the center of that vein.

Q. Now, wait a minute. The Maury lode is not involved in this action in any way whatsoever; consequently you may limit yourself to the crucial points upon the ground involved in this action.

A. By that I understand the Wizard placer, and the Hickman lode,—

Q. You may take the lode claims.

Judge DEY.—Is the Hickman in, Mr. Budge?

Mr. BUDGE.—Yes.

Judge DEY.—All but the Maury—

Mr. JACK.—All but the Maury and Tennessee.

Judge DEY.—All but the Maury and Tennessee. Yes; the Maury and Tennessee are not in.

A. At the corner 5 of the Hickman lode, the southeast corner of the lode, the phosphate emerges from the overlying strata, as does the limestone band overlying the alleged vein above; and southeast of 5, and without the limits of the Hickman lode, and extends without the limits of the Hickman lode, and above the limits of the Hickman lode, for about 100 feet, and then dips down into the Hickman lode; so that for that distance of 100 feet the outcrop, so to say,

(Testimony of C. L. Breger.)
of the supposed phosphate vein is above and outside of the Hickman lode. Also, in the southwest extension of the Hickman lode I examined the corners marked on Defendant's Exhibit 2 as 10, 6 and 8, and found within this extent that this portion of the Hickman lode was not on [764] phosphate at all, but was in the underlying limestone. Then—

Q. Wait a minute. Before you leave that place, the condition, as explained and as shown by this exhibit, wherein is the important and crucial points, is what I don't understand.

A. In that the important point was to demonstrate whether the outcrop occurred within or without the lode at certain points.

Q. That is all there was of it?

A. Oh, no, sir; and to demonstrate that by the corners on the ground. That is to say, we determined, for instance, in the Arkansas lode, that within this area the lode was within the alleged vein, or within the lode; whether it was five feet below I considered immaterial.

Q. Now let us just get to the point.

A. I want to understand the point; probably I don't.

Q. Now, the point is to explain or to show whether it was within or without, on the outcrop, the exterior boundaries of the lode claim?

A. And placer, and to verify the correctness of the delineation of the line of emergence of the alleged vein.

Q. At this place shown on this photograph of Ex-

(Testimony of C. L. Breger.)

hibit 4 the exposure of the bed of phosphate is truncated? A. Yes.

Q. Eh? A. Yes—by erosion.

Q. Truncated by erosion? A. Yes, sir.

Q. Did you select that place for taking the photo?

[765]

A. I didn't take that photo.

Q. I didn't ask you that; I asked you if you selected that place? A. For taking the photo?

Q. Yes.

A. No, sir; I had nothing to do with that photo.

Q. It stands out there truncated, just like in the Charles Dickens mine in Idaho,—a lead-silver?

A. I have never examined that mine?

Q. Oh, you haven't? A. No.

Q. And I was going to ask you how they mined at the Charles Dickens, where it is truncated?

A. I am not acquainted with that mine, either by examination or investigation.

Q. Now, you said at near the close of your direct examination that you didn't know anything about the different ways of mining.

A. I didn't say that; I said I wasn't a miner. I didn't say I didn't know anything about the different ways of mining.

Q. Oh, I see. You understand mining by the sluicing system, do you?

A. I have a faint idea of it, as practiced in Arizona.

Q. Just a faint idea? A. Yes.

Q. Do you have an understanding of the operation

(Testimony of C. L. Breger.)
of mining by the caving system?

A. Of the caving system? **[766]**

Q. Yes.

A. Do you mean by "caving system" what is known as—

Q. I mean, sir, in the ordinary mining parlance. I use the words "caving system" in the ordinary mining parlance, not in a geological sense.

A. The caving system, as I understand it, is where a deposit is mined out and no timbers are allowed to stand, and the deposit allowed to take care of itself; that is, the roofs and floors are allowed to take care of themselves.

Q. Where have you seen the caving system of mining?

A. I don't know that I have ever seen it anywhere.

Q. What do you know about the Stulling system of mining? A. The which?

Q. The Stulling system. A. I never heard of it.

Q. The square set system?

A. Well, that is simply a method of installing timbers in mines, without reference to the manner of mining itself,—

Q. It is what? A. —as I understand it.

Q. As you understand it? You don't know anything about it?

A. I am not a miner. I say, as I understand it.

Q. You understand more about quarrying?

A. A little more.

Q. Eh?

A. A little more, and that I have seen and exam-

(Testimony of C. L. Breger.)

ined more quarries than I have mines; but I am not a quarryman, either. [767]

Q. I will now take it over in Wyoming there, with a dip of 85°—

A. What part of Wyoming are you referring to now?

Q. These claims in question. A. Yes.

Q. That is the dip, isn't it—about 85°?

A. Approximately.

Q. Approximately 85°? What process of quarrying have you in mind? You have answered here that it is quarried.

A. In the Raymond Canyon itself the phosphate bed could be quarried to a very slight extent; but, of course, it would have to be mined there as a bed of coal is mined, standing on edge.

(At the request of Judge Dey the last question was repeated.)

Mr. BUDGE.—As I understand, the witness didn't say that this was quarried in Raymond Canyon. If he did, I haven't any recollection of it.

WITNESS.—I didn't say that.

Judge DEY.—Q. Take the Raymond Canyon, where the properties are which are involved in these Wyoming cases, where the dip is approximately 85°; how would you mine that by the quarry system?

A. I would hire a miner to do that.

Q. In short, you know nothing about the practical operations of mining, do you?

A. I wouldn't say that—I wouldn't say that I know nothing about the practical operations. [768]

(Testimony of C. L. Breger.)

Q. Practically nothing? A. No, sir.

Q. You would say that you understood the system of mining? A. Not thoroughly.

Q. Blasting is required in this phosphate rock, isn't it, at depth? A. At depth?

Q. Yes.

A. Where the rock is sufficiently hard I suppose it would be.

Q. In other words, you suppose that wherever blasting is required, blasting is required?

A. Why, no.

Q. Eh?

A. No. The rock, as a matter of fact, could be very economically mined out with channeling machines, or mechanical cutters.

Q. With a channeling machine?

A. Yes, sir, without blasting.

Q. Are they in use in Idaho?

A. I believe they are, in coal mines in Idaho. In fact, I am certain they are in use in Montana. No, I don't know that they are in use in Idaho coal mines; but Idaho coal mines are not sufficiently developed. No, I would say they are not in use in Idaho; but they are in Montana.

Q. Passing from that subject now to this great extensive area you have referred to as being—under which, if I understood [769] you correctly, you say asphaltum beds exist; is that right?

A. Where is that?

Q. This great extensive area which you have described, under which you say it is all one layer of

(Testimony of C. L. Breger.)

asphalt—or, phosphate rock?

A. I didn't say that. I said the phosphate was originally deposited and has been in existence over the entire area within the limits described, and so far as its extension outside is concerned we don't know, but it probably does extend.

Q. When you say "has been" you don't refer to the present?

A. I do, in the same sense as I would refer to a coal bed over a similar area.

Q. Now, for illustration, I call your attention to the yellow exhibit, Defendant's Exhibit 1. Throughout the territory shown upon that exhibit the green colored is where the exposures of phosphate rock occur?

A. So far as I know. I didn't examine it.

Q. Well, that is about the way, throughout that country? A. Yes, sir.

Q. Do you mean to say that it is the same throughout a territory of several hundred miles square?

A. Throughout a territory of several hundred thousand miles square you find this same series of phosphatic shale, in precisely the same stratigraphic association, as you would find a series of coal-bearing shales, or coal-bearing measures, as they are known. Throughout this area you find at the base of the measures a workable, although not always the main phosphate [770] bed, and there are other beds higher up within the shale. These beds—

Q. What question have I asked was it that calls for this speech?

(Testimony of C. L. Breger.)

A. Will you read the question, please?

(The last question was repeated, as follows:)

"Q. Do you mean to say that it is the same throughout a territory of several hundred miles square?"

A. Do you want me to answer that now?

Q. No. Now, take the mines in limestone, at Park City — A. Did you mean—

Q. —Bingham, Mercur, or the Tintic districts, or Eureka, Utah, or Deep Creek, in Utah and Nevada, and over at Leadville in Colorado; you would make the same application there— A. No, sir.

Q. —that you do—let me talk a minute and I will give you a chance—that you do with the phosphate deposits, would you not?

A. I would not. In that—

Q. Hold on. That answers it. Isn't one just as reasonable as the other? A. Certainly not.

Q. Have you made a study especially to ascertain?

A. A study to ascertain?

Q. Yes.

A. I have studied enough to ascertain. [771]

Q. Have you made a special study—

A. A special study—

Q. —covering the questions suggested?

A. I have made a study—

Q. Just answer the question.

A. A special study?

Q. Yes.

A. For that particular purpose?

Q. He will read it—he will read the question.

(Testimony of C. L. Breger.)

A. No, I have not—as the question is put.

Q. You visited the ground involved in these actions quite recently? A. Yes, sir.

Q. For what purpose?

A. For the purpose of verifying my recollections of it, having turned in my note-books to the Geological Survey, and not having any notes at hand; and for the purpose of qualifying myself so far as possible as to any details that I might be questioned upon, to answer them, by either one side or by the other.

Q. In respect to what, in particular?

A. As to the form and nature of the deposit.

Q. As to the form in which it was found?

A. As to the form in which it occurs and was—yes, as to the form in which it was found in this particular area.

Q. Referring now to the Wyoming properties or lode claims; you found that the dip was about 85—approximately 85°?

A. Approximately; but sometimes in one direction, and sometimes in the other. [772]

Q. But approximately 85°? A. Yes, sir.

Q. What thickness did you find the series to be?

A. The phosphate series in Raymond Canyon and the vicinity, do you mean?

Q. The properties that you claim are in the Wyoming cases.

A. As near as I can remember, about 150 feet, I should say.

Q. How did you get that?

(Testimony of C. L. Breger.)

A. Because I made those measurements once, and those notes were turned into the survey—maybe 125 feet, maybe 165.

Q. You found it in place in the body of the mountain?

A. As much so as the other strata—no more and no less.

Q. Well, that is in place as much as anything could be in place, is it not? It is part of the mountain?

A. Well, it is rock in place as much so as the other strata, and neither more nor less.

Q. What do you understand by the words "rock in place"?

A. "Rock in place," as I understand it, would be solid rock, or solid conglomerate, forming part of the country, and not a deposit resting on it.

Q. Now, I ask you whether this was not rock in place? A. Yes.

Q. As a geologist, let me ask you: Assuming that there was a fissure cutting the bed of this property at Montpelier, filled with the allotropic form of apatite; would you class it as a vein or lode?

A. Do you mean a vein or lode in the geologic sense; or [773] a vein or lode deposit, subject to a vein or lode location?

Judge DEY.—Read him the question. You pay attention to the question.

(The last question was repeated, as follows:)

"Q. As a geologist, let me ask you: Assuming that there was a fissure cutting the bed of this property at Montpelier, filled with the allotropic

(Testimony of C. L. Breger.)

form of apatite; would you class it as a vein or lode?"

A. Such a deposit would be a true fissure vein, and being a mineral it might be—there might be some justification for locating such a deposit as a lode or vein.

Judge DEY.—That's all.

Redirect Examination.

(By Mr. BUDGE.)

Q. Mr. Breger, you said in referring to this great area within which this deposit of phosphate rock was found, that it was some hundreds, or hundreds of thousands of miles square—something to that effect. You meant square miles?

A. Square miles, yes. And if I may, I might make another correction which I think I misstated yesterday.

Q. All right.

A. I think I mentioned the finding of phosphate in Horse Canyon, near Brent's ranch, ten miles north of Circle. I meant ten miles north of Dubois, Wyoming.

Q. You mean Dubois, Idaho? [774]

A. Wyoming.

Q. Wyoming?

A. Wyoming. I may have said Dubois, but I think I said Circle.

Q. In main phosphate beds you don't find phosphate nodules? A. Phosphate nodules?

Q. Yes.

A. Why, you find these phosphate oolites; you

(Testimony of C. L. Breger.)

don't find limestone nodules.

Q. You don't find limestone nodules?

A. You don't find limestone nodules, as far as I have examined it, in the Wind River Mountains and elsewhere.

Q. Now, in referring to this, counsel asked you if this was not a complicated subject. I will ask you whether in geology there is anything exactly similar to this deposit?

A. There is nothing exactly similar. The nearest similarity is with the black shale deposits, which occur in the Devonian black shale in Tennessee, and which extend into Northeast Georgia and Northwestern Alabama.

Q. Well, what common deposit is it that has the greatest similarity to this bed?

A. The hard rock of Florida. In being a rock in place?

Q. Yes; but I am asking about other deposits other than phosphate?

A. Oh, the nearest? Well, there are a lot of deposits which could be considered near, geologically, or in a mining sense, including particularly coal, gypsum, salt, sandstone, [775] ordinary limestones, which are indeed often quarried for furnishing fertilizers, especially chalky phosphatic limestones; and numerous other deposits.

Q. Are you acquainted with Dr. Girty?

A. Yes, sir.

Q. Dr. George H. Girty? A. Yes, sir.

Q. Have you seen a bulletin published by him,

(Testimony of C. L. Breger.)

known as Bulletin No. 436, entitled "The Fauna of the Phosphate Beds of the Park City Formation, in Idaho, Wyoming and Utah"? A. Yes, sir.

Q. Have you read that bulletin?

A. Why, I haven't read it through. I have seen it, and read parts of it.

Q. What is meant by the fauna?

A. The fauna is an aggregate of fossil animals, as distinguished from flora, which includes fossil—well, in this geologic case, fossil plants. But fauna in general is a series of living animal organisms.

Q. Are these shales and fossils shown clearly in this deposit of phosphate rock?

A. They are particularly conspicuous in some of the shale and limestone bands in the phosphate series; and I have myself found fossils in the main phosphate beds on the Waterloo claim, and in the area covered by the Obed lode, in Gertch Canyon.

Q. Are you acquainted with Eli Blackwelder?

A. Yes, sir.

Q. Who is Mr. Blackwelder?

A. Mr. Blackwelder is Professor of Geology in the University [776] of Wisconsin, and is employed also on the Geological Survey.

Q. And were you with him in your trip throughout this country? A. In 1910, yes, sir.

Q. In 1910?

A. He was the administrator at the head of the party, although we both consulted as to the work to be done.

Q. In the experience which you had in the field in

(Testimony of C. L. Breger.)

connection with the Geological Survey, and in the preparation of reports, was it the practice throughout the area visited by the members of the party to make inquiries of persons owning different properties, that the party desired to examine?

A. Yes; that was the usual practice with the Geological Survey in all its field parties. But the personal opinions of these parties were never allowed to influence the report made thereon.

Q. However, you made inquiries, did you, of mine managers and foremen and so on, in regard to these properties, and obtained what assistance they were able to give you, in expediting your examination of the properties? A. We did, in 1909.

Q. Well, was that the practice of the Survey while you were with it? A. Yes, sir.

Q. Was that the practice? A. Yes, sir.

Cross-examination.

(By Judge DEY.) [777]

Q. You have just said that the reports were not influenced by the mine owners, or those engaged in the mining. You mean, I take it, only so far as you are concerned?

A. So far as I am concerned, and so far as I am aware.

Q. And so far as you are aware? A. Yes, sir.

Q. You have no knowledge upon that subject as to Mr. Weeks, have you, who was on the stand here?

A. I have no knowledge directly.

Judge DEY.—That's all.

Mr. BUDGE.—You may explain, if you have any

(Testimony of C. L. Breger.)

further explanation.

A. Mr. Weeks was geologist on the survey, and like geologists who enter every mining camp, inquired of the mine managers, mine superintendents, or those in authority, for permission to examine the workings of the mine, without which examination the survey of the field would have been totally inadequate; and that is the usual custom everywhere. But so far as allowing the mine managers' statements or opinions to bias in any way at all improper, the report, why I know of no instance on the Geological Survey in which that has been the case.

Judge DEY.—Q. You would be surprised, then, if you were informed of an instance where a person, while in the service of the Government, was privately working in, or was working and advising private persons in respect to legal rights in the matter?

A. I would not.

Q. You would not? [778]

A. No, sir. I have heard—

Q. I see. It is frequently done? A. No, sir.

Q. Well, then, would you be surprised or not?

A. I know of one such case.

Q. You would not be surprised?

A. That is, I know of it by hearsay.

Q. Do you know of such a case by hearsay?

A. Yes, sir.

Q. Is it of common occurrence?

A. It has not occurred in the Geological Survey at all.

Q. Oh, it has not? A. No, sir.

(Testimony of C. L. Breger.)

Q. What department?

A. It was in the Land Office, I believe.

Q. In the Land Office, and you have heard of but one instance?

A. That is all I have heard of.

Q. Who was that?

A. I believe it was a Mr. Sterling, who was sent out to investigate, as near as I have been made to understand, as to the—

Q. I asked you who it was. I am not asking for hearsay from you, my dear sir. Who was it?

A. Will you repeat the question, please?

(Said question was repeated.)

"Q. Who was that?"

Judge DEY.—That is all the question.

A. Mr. Sterling, as I have been made to understand. [779]

Q. Mr. Sterling? A. Yes, sir.

Judge DEY.—That's all.

Mr. BUDGE.—Q. Just one more question, Mr. Breger: As a geologist, Mr. Breger, I will ask you whether or not this calcium phosphate is ore?

A. No, sir.

Q. And why not?

A. An ore must above all contain some economically valuable metal which can be extracted and usually is extracted therefrom. As a matter of fact, many deposits which do contain metals, and which metals are often extracted therefrom, are not considered ores, in the sense that calcium may be extracted and is extracted from limestone; but limestone or

(Testimony of C. L. Breger.)

chalk is not considered an ore on that account. Nor is phosphorus a metal.

Q. Well, the reason this is not ore is, as you say, because it does not contain a metal for which it is mined, for the purpose of extracting that metal?

A. Yes, sir; that is correct.

Mr. BUDGE.—Well, that is all.

Judge DEY.—Q. Is there from your standpoint some strict line of demarcation between metalliferous and nonmetallic ores?

A. Between metalliferous and nonmetallic ores?

Q. Yes.

A. Those are two entirely different classifications, in that—would be— [780]

Q. Well, if the question is not intelligible to you, I will reframe it. Read the question.

(Said question was repeated, as follows:)

"Q. Is there from your standpoint some strict line of demarcation between metalliferous and nonmetallic ores?"

A. Between metalliferous and nonmetallic ores?

Q. Yes—some strict line of demarcation—dividing line, in other words?

A. Yes, sir; between metalliferous and nonmetallic ores there is.

Q. Between the classification—

A. —of metalliferous and nonmetallic ores there is a distinct dividing line, and those ores which are—

Q. Of the classification?

A. —of metalliferous and nonmetallic ores?

Q. Yes.

(Testimony of C. L. Breger.)

A. I wish to emphasize the two words in this connection.

Q. I will not be technical at all, myself, you understand.

A. Well, you are speaking of a technical subject, so I cannot apply loose and general definitions on a technical subject very well.

Q. As the question was asked, it is not intelligible to you? Is that it?

A. It was intelligible to me, as asked.

Q. Is your answer yes or no, as to whether there is any line drawn separating the two classes?

A. Of metalliferous and nonmetallic ores? **[781]**

Q. Yes. A. I would say there is a distinct line.

Q. Or minerals?

A. The word "nonmetallic" there is very ambiguous, and as the question is put there I should say there is no distinct line.

Judge DEY.—That's all.

Mr. BUDGE.—Q. But in the technical sense give your explanation, Mr. Breger, as to the difference between metalliferous and nonmetalliferous ores.

A. That is a different question altogether. The difference between metalliferous and nonmetalliferous ores is a different question than one between metalliferous and nonmetallic ores; and answering this question directly I should say that a metalliferous ore is a mineral or rock product from which the common metals are extracted, and which is mined primarily for that purpose; and a nonmetalliferous ore includes all valuable minerals, or rocks, or minerals,

(Testimony of C. L. Breger.)

or rock bearing deposits which are not mined primarily for the extraction of a common metal.

Q. As the term is commonly understood in geology, are there ores which are not metalliferous? In other words, to constitute an ore, or a substance an ore, must it not contain metal?

A. It must certainly contain metal.

Q. And I will ask you whether it is not also necessary that in order for it to be an ore that it must be mined for the extraction of that metal?

A. Yes, sir. [782]

**[Testimony of Fred. B. Weeks, for Defendant (Recalled—Further Cross-examination).]**

FRED. B. WEEKS, a witness heretofore called in behalf of the defendant, and duly sworn, being recalled for further cross-examination, testified as follows, to wit:

Cross-examination.

(By Judge DEY.)

Q. You are familiar with the classification of veins, are you not? A. I think so.

Q. And in general classification there are stratified veins or bed veins, are there not?

A. There are what is known as bedded veins.

Judge DEY.—Just read him the question, and see if we can get an answer.

(Said question was repeated, as follows:)

"Q. And in general classification there are stratified veins or bed veins, are there not?"

A. I don't know in general classification of stratified veins; I do know of bedded veins.

(Testimony of Fred B. Weeks.)

Q. Is the work entitled "Ore Deposits of the United States and Canada," by Kump (?), a work of established reputation and acknowledged authority, Mr. Weeks? A. Yes, sir.

Q. I have the Third Edition. In the appendix, page 448, it says: "In the following pages the principal schemes of classification of ore deposits are graded according to certain relationships and similarities running through them," and under [783] the schedule of "Scheme involving the Classification of Ores," on page 452, I call your attention to the classification given by Lottner-Serlo, in which I find note "B. STRATA. BEDS. SEAMS." That is given there, is it not? A. Yes, sir.

Q. On page 453, "J. D. Whitney, Metal Wealth of the United States, 1854," under subdivision 2, reading:

"STRATIFIED.

"A. Constituting the mass of a bed or stratified deposit.

"B. Disseminated through sedimentary beds.

"C. Originally deposited from aqueous solution."

On page 454, "J. S. Coobre (?), School of Mines, March, 1880, under subdivision 2:

"STRATIFIED.

"A. Forming entire strata.

"B. Disseminated through strata.

"C. Segregated from strata."

On the same page, "J. A. Phillips, Ore Deposits, 1884," under subdivision 2, entitled:

(Testimony of Fred B. Weeks.)

"STRATIFIED.

"A. Deposit constituting the bulk of metalliferous beds formed by precipitation from aqueous solution.

"B. Beds originally deposited from solution, but subsequently altered by metamorphism.

"C. Ore disseminated through sedimentary [784] beds in which they have been chemically deposited."

Does it not thus appear that bed veins and stratified veins are referred to in the works of science?

A. They are referred to in this, classifications which were made thirty years ago.

Q. And extending back even further than thirty years ago? A. Much further.

Q. Going back to the time of the great old Roman, Agricola, do they not?

A. I understand so. I never read the works.

Q. In the 16th century? A. I think so.

Q. Does phosphorite occur in veins?

A. I think it does. I have never seen it personally, but I believe it does.

Q. It may occur in veins?

A. I think so. I believe so.

Q. And in pockets? A. I believe so.

Q. In veins with strike and dip?

A. Yes; I should expect them to have strike and dip.

Q. Is arsenic a metal? A. I think so.

Q. How long since it has been classed as a metal?

A. I couldn't say.

(Testimony of Fred B. Weeks.)

Q. It hasn't been?

A. I am not sure about that. I said I thought so. I am not sure about it. [785]

Q. Oh, you are not? A. No, sir.

Q. What is your opinion about it—about the proper classification?

A. I don't think it would be properly classified as a metal.

Q. Have you looked in the old and new encyclopaedias to determine as to the former and present classification of arsenic, in reference to it being metallic or nonmetallic? A. No, sir, I have not.

Q. How about antimony?

A. I think it would be classed the same.

Q. As a metal? A. Nonmetal.

Q. Taking your explanation of the deposit or deposits involved in these actions, when describing it, you took it or considered it as a whole, did you not—the series?

A. I think I described them as a whole, and also as to the separate parts. I think so.

Q. You described them both ways?

A. I think so.

Q. In your opinion it should be treated as a whole, should it not? A. No, I don't think so.

Q. You would take each separate strata of the rock and consider that separately, would you, in determining the question whether or not it constitutes—there is a vein or lode?

A. I think you will have to consider them both ways, both as a whole and as to the separate parts

(Testimony of Fred B. Weeks.)

which make up the [786] whole.

Q. In determining that question?

A. In determining the question, yes, sir.

Q. Assuming that the whole series constitutes a vein or lode, and that the time will come when these several strata of phosphate rock can be mined at a commercial profit, in the mining operations sorting would be required, would it not?

A. There are some of the beds in which sorting would be required; in some of it it would not be required.

Q. There would be also encountered foreign material in the other intervening strata that you have described?

A. As the question is asked there would not be foreign material encountered.

Q. Your answer seems to indicate that if the question were asked in some other manner your answer might be different.

A. The answer to the question hinges on the word "foreign."

Q. Oh. What would you substitute for that word—in classifying it?

A. I don't think I could substitute one word to take the place of it. I would have to explain what I mean by "foreign," and I don't think one word would explain it.

Q. I see. I mean material other than the phosphate rock.

A. You would encounter other material than the calcium phosphate. Yes, I would say you would

(Testimony of Fred B. Weeks.)

encounter other material than the phosphate rock.

Q. Throughout the intervening layers is there found tricalcic phosphate?

A. I think there is some tricalcic phosphate in all the intervening layers. [787]

Q. In all the intervening layers? A. Yes.

Q. Of some percentage? A. Yes, sir, I think so.

Q. How far does the ore in the Park City, in the limestone formation, continue on the dip of the beds?

A. As I have already stated, as far as my knowledge goes the statement that was made that it extends eight miles on the dip would be correct.

Q. You evidently don't understand the question. I was referring to the ore mined—the lead-silver ore? A. In Park City, Utah?

Q. Yes? A. I don't know.

Q. The formation there you know to be continuous on the dip, do you not?

A. Why, I know it to some extent, yes, sir.

Q. It may go on and on indefinitely for all you know?

A. Oh, yes; it goes on until it comes to an end. All formations, of course, have an end; but I don't know what length would be the end of it.

Q. Yes, all formations; and you are not able like Mr. Breger to tell us for 100 square miles, or 100 miles square?

A. I think I have already testified to what I consider the extent of this phosphate bed; but I don't know the extent of the lead-silver deposits.

(Testimony of Fred B. Weeks.)

Redirect Examination.

(By Mr. BUDGE.) [788]

Q. Who is your authority, Mr. Weeks, for the statement that this phosphate bed extends eight miles on the dip?

A. The Director of the Geological Survey, George Otis Smith.

Q. In speaking if this whole series were mined, or if the time should come that it ever was mined, that other materials would be encountered; do you mean that other materials in the various layers of calcium phosphate would be encountered, or materials which exist in layers or beds between those various layers of calcium phosphate?

A. I think it would be in both places; and to make that answer clear I would say—

Q. You may explain it.

A. I would say that in the lower main bed of phosphate there would be no foreign materials, or other materials, rather, encountered; in the other layers of the phosphate series, during the process of sedimentation of those layers, clayey materials were brought in and deposited at the same time that the phosphoric acid was deposited; and in those layers you would encounter those clayey materials.

Q. And as a matter of fact it is for that very reason that these beds above the lower beds are not of commercial value?

A. Yes, sir; they are not of commercial value at the present time.

Q. And at this time no other bed than the lower bed is mined? A. No, sir, no other bed is mined.

(Testimony of Fred B. Weeks.)

Q. And that is true upon all these claims in question? A. Yes, sir. [789]

Q. Now, I will ask you, Mr. Weeks, if you have any notes showing the width of these various layers in the series—the width of the several beds, as shown on Defendant's Exhibit 4? Give us the width of the calcium carbonate and the width of the several layers above it.

A. The thickness of the main phosphate bed, as shown on Defendant's Exhibit 4, is 5 feet and 5 inches. The thickness of the bed of limestone overlying this main phosphate bed, in this section on Defendant's Exhibit 4, is two feet.

Q. Just a minute. I will ask you, Mr. Weeks, to mark in on this Defendant's Exhibit 4 these figures as you give them, stating the widths of these different beds.

A. The phosphate layer which overlies the limestone marked two feet, is two feet and two inches in width. The limestone which overlies the phosphate bed marked two feet and two inches is 18 inches in thickness. The phosphate bed overlying the limestone bed marked 18 inches is 16 inches in thickness. I could not give the exact thickness of the other beds without referring to my notes.

Q. Have you your notes with you?

A. I have not. I can furnish them so that I can finish this—this thickness. My notes are at the hotel.

Q. All right. We will just have you clear that up. Now, Mr. Weeks, I think you have stated—well,

(Testimony of Fred B. Weeks.)

I will ask you the question again: Do you consider this five-foot bed of calcium phosphate a vein or lode?

A. No, sir.

Q. Now, would you consider a five-foot fissure containing valuable deposits of apatite a vein or lode? [790]

A. I think so.

Q. Now, would you consider a five-foot vein of—a bed, rather, of coal, a vein or lode?

A. I don't think so.

Q. Would you consider a five-foot fissure containing valuable deposits of graphite or diamonds, a vein or lode?

Judge DEY.—What is the last word?

Mr. BUDGE.—A fissure containing valuable deposits of graphite or diamonds.

Judge DEY.—Oh—diamonds?

Mr. BUDGE.—Diamonds, yes.

Judge DEY.—That is what I couldn't understand.

Mr. BUDGE.—Q. —a vein or lode?

A. I think so. If it had the structure and form of a vein or lode it would have to be classified as such.

Q. Now, coal and graphite and diamonds, they are different forms of carbon, are they not?

A. Yes, sir.

Q. And calcium phosphate and apatite are different forms of what?

A. They are different forms of phosphate.

Q. Now, in this sorting process which you say might be necessary, if this entire series of phosphate beds were mined, would that sorting comprise simply

(Testimony of Fred B. Weeks.)

the taking out of the limestone nodules?

A. It would, in part, and in separating the shaly material from the phosphatic material as much as possible. [791]

Q. Now, Mr. Weeks, concerning these series, I will ask you whether these various beds of limestone and shale and phosphate rock are distinct from one another? A. Yes, sir.

Q. And have they all floors and roofs, the same as the lower bed?

A. That is true. What I mean by that, and by the statement that they are distinct and separate, is that each bed maintains its individuality as a bed wherever it is found, or wherever it has been exposed; that in no place do we observe the phenomena of the shale bed between two phosphate beds disappearing and the whole thickness taken up by the two phosphate beds; and in that way each bed is continuous for itself—has its individuality—and each is the floor and roof of the other, respectively.

Q. So that the roof of this bed of calcium phosphate which is mined, and which is the only bed of the series that is mined, has a roof? That bed has a roof of limestone two feet in thickness?

A. Yes, sir.

Q. And the basal limestone, the thickness of which is not yet determined—is not determined?

A. No, sir.

Q. And at present none of the material above the two-foot bed of limestone which is over this lower

(Testimony of Fred B. Weeks.)

bed of phosphate, is of any economic or commercial value?

A. No; it has no commercial value whatever.

Q. And is not necessarily taken out or mixed with the lower bed in the mining of the same? [792]

A. No, sir.

Q. Or in the use of the same? A. No, sir.

Q. And in mining the bed that is mined, there is no sorting process to eliminate any of the these materials of these upper beds? A. No, sir.

At this time a recess was taken until this afternoon at two o'clock. [793]

At two o'clock P. M. the hearing was resumed.

FRED. B. WEEKS, a witness heretofore called in behalf of the defendant, and duly sworn, being recalled in behalf of the defendant, testified as follows, to wit:

Direct Examination.

(By Mr. BUDGE.)

Q. Calling your attention to the Defendant's Exhibit 4, Mr. Weeks, did you find your notes which give you the thickness of these other strata?

A. Yes, sir.

Q. You may fill them in on the exhibit—the width of these strata which you have not marked—the width of which you have not marked so far.

A. Shall I read each one, or simply enter it?

Q. Just read it as you enter it, commencing with the shale above the 16-inch layer of phosphate.

A. The two upper layers that I have marked I

(Testimony of Fred B. Weeks.)

want to change them slightly, to correspond exactly to my notes.

Q. All right.

A. The other being given from memory. The bed of limestone which overlies the two-foot two-inch layer of phosphate is 15 inches in thickness, instead of 18.

Q. All right.

A. The bed of phosphate which overlies the limestone marked 15 inches is 11 inches in thickness. The bed of shale [794] which overlies the 11-inch phosphate is 16 inches in thickness. The bed of phosphate which overlies the 16-inch bed of shale is twelve inches in thickness. The bed of limestone which overlies the 12-inch bed of phosphate is six inches in thickness. The bed of phosphate which overlies the 6-inch bed of limestone has been eroded, so that it varies in thickness from three to six feet, according to the amount of erosion which has taken place at the top of the bed.

Q. What is the width of it where it is not eroded, Mr. Weeks?

A. I think the maximum thickness is six feet. That is the greatest thickness I have ever seen of it.

Q. What is the percentage of calcium phosphate in that top bed? A. I don't know.

Q. Well, is it commercially valuable?

A. Yes, sir.

Q. At this time—for the purposes for which the lower bed is used?

(Testimony of Fred B. Weeks.)

A. I couldn't state, because I don't remember the amount of phosphoric acid contained in that bed. I know that the bed is shaly in character; but just the composition, to state whether it is commercial or not, I couldn't say.

Q. You mean to say whether it is commercially valuable or not?

A. No. I am inclined to think that there is so much shale in the bed that it reduces the amount of phosphoric acid below the point where it would be commercially valuable. I think so. [795]

Q. Now, Mr. Weeks, on cross-examination you stated, if I remember the testimony correctly, that if there were a fissure containing apatite, or a deposit of apatite—a fissure containing this apatite in its entirety—that it would probably be a vein or lode; but if it contained only a portion—of phosphorite, instead of apatite,—contained only a portion of phosphorite, that you thought it would not be a vein or lode. I want to ask you if you desire to correct your testimony in that respect?

A. I think I was considerably confused in answering those questions; and what I would say at the present time is, that if a fissure containing or made up of this phosphorite in its entirety, it would not be located as a vein or lode, because it was not metallic, and because it did not contain any gangue mineral or material from which the valuable part would be extracted.

Q. But would be mined as a whole?

A. Yes, sir. But if the fissure was formed of phos-

(Testimony of Fred B. Weeks.)

phorite in part and contained other materials from which the phosphorite would be extracted, it might be a question then as to whether it should be located as a vein or lode.

Q. What is the probability, as compared if the whole fissure was phosphorite?

A. Why, there would not be that doubt in my mind.

Q. There would not be the same doubt?

A. No, sir.

Q. For what reason?

A. Well, for the reason that the fissure being completely occupied by this phosphorite, the material would be mined as a [796] whole, and there would be no gangue present from which to extract the valuable material.

Q. While you were on the survey—the United States Geological Survey—throughout your experience of 18 years, was it customary for the officials connected with the survey, in making examinations of mining properties, to make inquiries and obtain information of mine owners and mine foremen, and assistance from them in the inspection of their properties, etc.?

A. Yes, sir, that was always the custom. I have myself written many letters asking for such information, and have obtained such information from mine owners and mine managers and foremen, and practically everyone connected with such works. I know that it is the custom to ask for letters of introduction where a man going into the country was a stranger to the people. I have written such letters, which

(Testimony of Fred B. Weeks.)

have been signed by the Director himself, for that purpose.

Q. During the time that you were on the geological survey, Mr. Weeks, did you have any interest, present or prospective, or have you since had any interest, or do you now have any interest, in any of these phosphate deposits?

A. I never had any interest in any phosphate deposit of any kind, in any place, either during my connection with the survey or up to the present moment, and I have now no interest in any phosphate mine or location of any kind.

Q. Have you any business or association or connection of any kind with Mr. Ferrier, who joins with you in this report which has been referred to, or with his company, the San Francisco Chemical Company? [797]

A. I have never had any business connection with M. Ferrier in any way. I knew Mr. Ferrier as a geologist on the Canada Survey for a good many years before we met at Montpelier; and I have never had any business connection with the San Francisco Chemical Company until January or February of 1911.

Q. Were you at any time—well, I will ask you since you have had anything to do for the San Francisco Chemical Company, have you received any pay from the Government, or been in its service in the Geological Survey, or any other department?

A. No, sir, I never have. The last pay I received from the Government for work was on the first of

(Testimony of Fred B. Weeks.)

March, 1910. That was when I closed my service with the Land Office. My name was carried on the rolls for several months after that, but I never did any services and never received any pay after the first of March, 1910.

Q. And you were not, after the first of March, 1910, under the supervision of the Geological Directors?

A. No, sir.

Q. The Director of the Geological Survey?

A. No, sir, nor any other Government officer.

Q. Is there any deposit, Mr. Weeks, of which you know as a geologist or mining engineer, exactly similar to this phosphate deposit; or is it a deposit which is something different from any known deposit, up to the time of its discovery?

A. We have no deposit which is exactly similar to the phosphate deposits. I think the deposit which conforms most nearly to the phosphate deposit is that of the coal deposits of the Eastern and Middle States, from Pennsylvania to Alabama, [798] and extending through the Ohio Valley and Mississippi Valley States, there was a great deposit of coal, at the same geological period that the phosphate deposits were laid down.

Judge DEY.—I submit that this is not proper redirect.

Mr. BUDGE.—It is not quite responsive, that is correct; but I wanted to ask it, anyhow.

Q. Just go on with your explanation, and make it as brief as you can.

A. This coal area was characterized by an abun-

(Testimony of Fred B. Weeks.)

dant plant life. In the Western States during the same period of time there was a deposit of carboniferous strata, in which was a great amount of animal life, and in which the phosphate beds covering the area which I have described were laid down.

Q. Both of the same age?

A. These are the same age, and in a broad way they resemble each other.

Q. In the upper carboniferous age?

A. Yes, sir.

Q. Now, some of your reports have been referred to, Mr. Weeks, and you were asked on cross-examination if you published or caused to be published these reports, I think designated as Bulletin 340, published in 1907, and another report which is a part of 430-H, if I am correct.

(Handing report to witness.)

A. No; this is not the right one.

Q. Here it is. It is the bulletin on phosphate. Is that the one?

(Handing same to witness.) [799]

A. Yes.

Q. It is entitled "Investigations relating to Phosphates and Phosphorous, by the United States Geological Survey," published in 1906 as an extract from Bulletin 315. Now, under whose direction did you publish those reports?

A. Under the direction of the Director of the Geological Survey.

Q. Did he require you to do that?

A. My letter of instructions required me to make

(Testimony of Fred B. Weeks.)

those investigations and submit a report upon the same.

Q. And did he require you to publish it—request that you publish it?

A. That went without such request, because when it was turned in it was published, necessarily under his direction. I had nothing to do with the publishing of it.

Q. Oh, I see, and you didn't have it published yourself? A. No, sir.

Q. All you did was to submit the report?

A. Yes, sir.

Q. I want to call your attention just for one question to these Sage deposits: Do you know how they would be mined?

A. A considerable portion of them could be mined by stripping off the surface, and mining it in an open quarry.

Q. Is that the only way that portion could be mined? A. Yes, sir.

Q. And is it in that respect like the deposits—some portion of the deposits within the claims in controversy, that the mining of it would depend upon the particular locality from which you desired to take the deposit? [800] A. Yes, sir.

Q. From what you have observed, is there in any of these localities in this deposit any indication of any of these beds or strata pinching out, and being replaced by the one above or below? A. No, sir.

Q. They all maintain their individuality throughout the series? A. Yes, sir.

(Testimony of Fred B. Weeks.)

Q. How many days in all, Mr. Weeks, have you estimated that you spent on the ground in the examination of these phosphate deposits in question?

A. In the year 1906 I spent—

Q. Just all together?

A. Between 25 and 30 days.

Q. You stated on cross-examination that antimony was not a metal, I think. Is that correct?

A. No, sir.

Q. Do you wish to correct your testimony in that respect? A. Yes, sir. It is a metal.

Cross-examination.

(By Judge DEY.)

Q. Have you anything further to say since the noon recess as to whether or not arsenic is nonmetallic? A. Nothing further.

Q. Where did you get your information from with reference to the Witwaters rand? [801]

A. I have read several of the publications which describe it.

Q. Just name them. Just tell us how you got your information.

A. One is a publication by John Hays Hammond in a volume of the proceedings of the American Institute of Mining Engineers for the year—I can't give the exact year; it is about 1904.

Q. Yes. What else?

A. I don't recall the others. I remember this because I have read it and looked it over several times in the past two months.

Q. Well, the information from which you testified

(Testimony of Fred B. Weeks.)

was derived, if I understand it, from the publication by John Hays Hammond?

A. Essentially so. I had the general idea in my head before.

Q. Did you find on your visits and investigations at Park City that there are dikes cut across which displace the vein? A. I think so.

Q. They were of later occurrence than the vein, were they not? A. Probably.

Q. What is galena? A. Lead.

Q. What is the composition?

A. It would depend upon the form that it was in.

Q. Cube galena?

A. The metallic form of lead. [802]

Q. What is the composition—what elements?

A. It would be lead, with whatever other material it was combined with.

Q. You couldn't state now the elements that enter into the composition?

A. Other than I have stated.

Q. Eh? A. Other than I have stated.

Q. Well, it is never pure, is it?

A. No, I think not.

Q. Eh? A. It might be native lead.

Q. Crystallized galena, is it ever pure?

A. I have never seen it in that form.

Q. You don't know of its existence in pure form, do you?

A. No. As I have said, I have never seen it in that form.

Q. Now, won't you please give the different per-

(Testimony of Fred B. Weeks.)

centages of the different elements in galena, from the mineralogy which you have studied?

A. I have studied it, but I don't have it in mind at the present time.

Q. You are unable to say? A. No, sir.

Q. Are you able to state any of the elements other than lead? A. No, sir.

Q. Can't you state the next most important element? A. No, sir. [803]

Q. You were referring to similarity a few moments ago. Have you ever seen two veins exactly similar? A. No, not exactly.

Q. They are never just alike?

A. I don't know of any that are just exactly alike.

Q. Now, in the walls of this deposit which you have described, or vein, is there any phosphoric acid?

Mr. BUDGE.—Do you mean, Judge, the walls of the lower bed, or the walls of the series?

Judge DEY.—The bounding walls and the series.

A. I don't know that either the upper or lower limestones of the series contain phosphoric acid, or calcium phosphate either.

Q. You don't? A. No.

Q. Didn't you so previously testify?

A. I don't think so. If I have I didn't intend to say so.

Q. Have you never had an analysis made to find out? A. No, sir.

Q. You stated that you found it in the intervening strata?

A. Yes, sir. The limestone which forms the roof

(Testimony of Fred B. Weeks.)

of the main bed has been analyzed, and reported to contain phosphoric acid, and I believe it does.

Q. It has? And the separating strata also contains phosphoric acid? A. Yes, sir.

Q. All of them? Each and all of them? [804]

A. I think so. Each and every one of the beds comprising the series contains phosphoric acid.

Q. And the footwall underlying the lower phosphate rock also contains phosphoric acid, does it not?

A. I have never seen a chemical analysis of the rock, so I don't know.

Q. You don't know anything about that?

A. No, sir.

Q. You made no investigation as to that?

A. No, sir.

Q. You had just referred to the hanging-wall of the series? A. Yes, sir.

Q. In one of your answers?

A. Yes, sir. I don't know of the presence of the phosphoric acid either in the rock, in the limestone that overlies the phosphate series nor in the limestone that underlies the phosphate series. I don't know of the presence of phosphoric acid in either of them.

Q. But you have seen analyses that have been made from the hanging-walls of the series? A. No, sir.

Q. Oh, I understood you— A. No, sir.

Q. I understood you had.

A. No. I will not say that I had not.

Q. Well, why did you make no investigation to ascertain whether or not it carried phosphoric acid? [805]

(Testimony of Fred B. Weeks.)

A. The limestone that overlies the phosphate series is a very cherty, silicious limestone, and from its appearance one would not be led to believe that it contained any valuable materials, such as phosphoric acid. (*Separation*) *LAJ.*

Q. In even small quantities?

A. Why, it may readily contain small quantities. A great many limestones contain phosphoric acid.

Q. Well, that is what I am asking, is about that over-hanging limestone.

A. I am not saying that it does not contain phosphoric acid. I simply don't know. I have never seen a chemical analysis of the rock.

Q. You have no reason to believe that it does not—

A. No, sir.

Q. —contain some percentage of phosphoric acid?

A. No, sir.

Q. Now, you were asked something about the commercial value of the phosphate rock lying in the series above the bed series, and in that connection referred to future use. Do you know all about future use? A. No, sir.

Q. You don't? A. No, sir.

Q. Do you know anything of the future use?

A. I might have some ideas about it, sure.

Q. Do you know down in the Mercur District there in Utah, that gold camp, that cyanide brought the unexpected future use? A. Yes, sir. [806]

Q. And even you are unable to state what may happen? A. No, sir.

Q. In the economical reduction, or mining, or

(Testimony of Fred B. Weeks.)

transportation, or anything else that enters into the production and use of it in the future?

A. No, sir, only such ideas as I may have.

Q. It is, Mr. Weeks, to the past rather than to the future that you state with certainty?

A. Usually.

Judge DEY.—Yes. That's all.

Redirect Examination.

(By Mr. BUDGE.)

Q. And also the present? A. Yes, sir.

Q. And in all of these beds or strata overlying this commercially valuable bed, none of them contain phosphoric acid in sufficient quantity to make them at the present time of commercial value?

A. No, sir.

Recross-examination.

(By Judge DEY.)

Q. Mr. Jack wants me to ask one more question: When you entered the employ and performed the first service for the San Francisco Chemical Company, was there any other company operating phosphates in Idaho or Utah or this section, that you were connected with, prior to your connection with the San [807] Francisco Chemical Company?

A. In no way, except as I have stated with regard to my visit to Judge Richards.

Q. What company was that?

A. The Union Phosphate Company.

Q. And after that visit to Judge Richards were you in their service? A. No, sir.

Q. At all? A. Not at all.

(Testimony of Fred B. Weeks.)

Q. Acting in litigation? A. None whatever.

Q. As a witness? A. No, sir.

Q. Eh?

A. No, sir, not until the time that I acted as a witness for the Union Phosphate Company in their case in the winter of last December.

Q. Last December?

A. I don't remember whether it was December or not, but it was recently.

Q. Had that service anything to do with your resignation from the Government?

A. No, sir, absolutely nothing.

Judge DEY.—That's all.

Mr. BUDGE.—Q. In view of the fact that there has been some extracts read in regard to phosphorite from the Encyclopaedia Britannica, I will ask you, Mr. Weeks, whether Bryner and Newsome are recognized authorities on economic geology? [808]

A. Yes, sir.

Q. Who is Bryner? J. C. Bryner, is it?

A. J. C. Bryner is now Vice-president of the Stanford University, and Professor of Geology.

Q. Who is Newsome?

A. Newsome is a professor of geology in the same university.

Q. John F. Newsome? A. Yes, sir.

Q. Calling your attention to page 320 of Bryner & Newsome's Syllabus of Economic Geology, I will ask you what definition is there given of phosphorite?

A. (Reading:) "Phosphorite includes the vitreous, earthy, scaly and fibrous forms of apatite. It

(Testimony of Fred B. Weeks.)

is found in Spain, Germany, and near Bordeaux, France, in veins and pockets. Not found in United States."

Mr. BUDGE.—That's all.

Judge DEY.—Q. Is it an allotropic form of apatite? A. I think so.

Judge DEY.—That's all. [809]

**[Testimony of Robert N. Bell, for Defendant.]**

ROBERT N. BELL, a witness called in behalf of the defendant, being first duly sworn, testified as follows, to wit:

Direct Examination.

(By Mr. BUDGE.)

Q. What is your name? A. Robert N. Bell.

Q. Where do you reside? A. In Boise, Idaho.

Q. How old are you, Mr. Bell? A. I am 47.

Q. What is your present occupation?

A. I am State Inspector of Mines.

Q. For what State? A. Idaho.

Q. And how long have you held that office?

A. Well, during the present term since the beginning of January of this year; and prior to that I held the position for three successive terms of two years each, between 1903 and 1909.

Q. Is that an appointive or an elective office, Mr. Bell? A. An elective office.

Q. What business did you follow prior to the time you were elected State Inspector of Mines?

A. Well, for some time prior I followed the business of mine valuer.

(Testimony of Robert N. Bell.)

Q. What is a mine valuer?

A. Just examining and reporting on the value of mining property for investors. **[810]**

Q. Passing on the property as to its value as an investment? A. Yes.

Q. And how long did you act as a mine valuer, and in what States?

A. Well, an indeterminate length of time. I commenced looking up properties for people say back about 1899, and probably occasionally before that.

Q. How is that?

A. Before that I was prospecting and developing and handling claims of my own, and acting as foreman and superintendent, is my recollection.

Q. When did you first become interested in any way in mining? A. Why, in 1883.

Q. Where?

A. In the west end of the Bozeman tunnel on the Northern Pacific Railway, and graduated from a mucker to a check tender and timberman's helper, in that piece of railroad work—one of the finest pieces of underground work that was ever accomplished in the west, I guess.

Q. And after 1883 what was the nature of your work, as far as mining was concerned?

A. I worked for nearly a year as a coal miner after that, for the Northern Pacific Coal Company, at Timberline, Montana.

Q. In what capacity?

A. As a coal miner—digging coal by the ton.

Q. And subsequent to that what did you do? **[811]**

(Testimony of Robert N. Bell.)

A. I worked for short periods at the Drum Lummon mine at Marysville; at the Weeks smelter in Montana; and for about two months on the Anaconda Hill in Butte; and came to Idaho in 1885.

Q. Prior to coming to Idaho what was the nature of the mining properties which you were employed upon? A. Coal, gold, silver, and copper.

Q. Lodes or placers? A. Both.

Q. Both?

A. I worked one season in a hydraulic placer mine near Helena, for about six weeks.

Q. A gold placer? A. Yes, a gold placer.

Q. After coming to Idaho in 1885 what did you do?

A. I worked in the quartz mines of the Salmon River country—for quartz mines principally, and placer mines occasionally.

Q. In what capacity there?

A. As a miner—a hard-rock miner.

Q. Hydraulic?

A. Hard rock. It is generally pretty hard rock.

Q. And how long did you continue at that, Mr. Bell? A. About four years.

Q. During any of the time that you have mentioned either while in Montana or Idaho, were you engaged in work as a prospector?

A. Yes. After my quartz mining experience in Idaho, the first four years, I prospected then for a number of years. [812]

Q. In what districts?

A. Well, principally in the Salmon River country, in Lemhi and Custer counties, and with several ex-

(Testimony of Robert N. Bell.)

cursions into Montana, and I found and developed a small vein or say of a number of gold quartz properties and placer claims.

Q. How long were you engaged in work as a hard-rock miner?

A. Oh, about nearly—for day's pay, a little over four years.

Q. And how long prospecting?

A. Oh, prospecting and odd jobs of handling small crews of men, for ten to twelve years.

Q. Did that ten or twelve years cover the time when you acted as a foreman? A. Yes.

Q. And in what mines do you now recall where you acted as foreman? A. The Brigand mine.

Q. Where is that?

A. It is in the Leesburg District, in Lemhi County. And the Shoofly mine, in the Leesburg Disrict. In the Lone Star mine, for Henry Walcott, of Denver, in the Sandy Creek District.

Q. Any other places?

A. Well, I handled a few men for myself on the Midland Belle mine.

Q. Where?

A. In the Wallace Creek District, in Lemhi County. [813]

Q. And any other experiences in mining other than those you have related, or any other districts in which you have operated as a practical miner?

A. Well, I have visited a good many mines up to that time, and all the principal mines of Custer County, and some of the Blaine County and Wood

(Testimony of Robert N. Bell.)

River, and some of the Butte mines, and read a good deal on the mining and geological subject—all I could get a hold of, in fact.

Q. Are you a geologist?

A. No. I never had any organized college experience at all, excepting as I have stated. I have studied the geological reports from the principal leading geologists of the United States and other countries, and text-books on the subject. I might say that I am a student of geology.

Q. Now, how many years, then, Mr. Bell, have you held the office of State Inspector of Mines?

A. I held the office from January, 1903, till December, 1908—six years.

Q. Six years—

A. —and six months of this year; and during that experience, of course, it has broadened my ideas a great deal. I have had the advantage of visiting a majority of the largest mines in Idaho and Montana and Utah and parts of Nevada, and have made a comparative study of the methods of ore deposition, and occurrence, etc.

Q. What are your duties as State Inspector of Mines?

A. I am required to visit each mining county in the State at least once each year, and such mines, or such operating mines therein as in my discretion would need inspecting and looking [814] after. I also have to gather statistics of output, and make a tabulated report of the vital statistics, and also to in a measure promote and advertise the mineral resources of the State.

(Testimony of Robert N. Bell.)

Q. Do you claim to be familiar, Mr. Bell, with the various mining properties of different kinds throughout Idaho? A. Yes, sir.

Q. Are there any important properties or working properties in Idaho which you have not visited?

A. No, I believe not.

Q. And in addition to the inspection of these properties have you inspected mining properties in other States, to any extent? A. Yes, sir.

Q. What particular properties? In what State?

A. Well, in Montana, principally the Butte mines, the Anaconda, and St. Lawrence, and Butte and Boston, and the Boston and Montana properties as a guest of the management, also as a guest of the mine inspectors up there, Mr. Oram and Mr. Welch, at different times; and in Utah I have examined the Daly-West a number of times.

Q. Where is that? A. At Park City.

Q. Yes?

A. Also the Silver King a couple of times, and part of the Ontario, and the— If you can help me out on the name of that mine, Mr. Breger?

Mr. BREGER.—The Conklin?

WITNESS.—No, not the Conklin—right up [815] the gulch from the old Ontario boarding-house.

Mr. BREGER.—Oh—the Wabash?

A. Yes, the Wabash. I made a report on that. That underlies the famous Park City quartzite region that carried so much silver—lead ore—silver ore. In Tintic, also, I have examined the east side mines, the

(Testimony of Robert N. Bell.)

Yankee-Con., and the Beck Tunnel, the Colorado, and the Sioux, and Iron Blossom; and in Stockton, the Bullion, and another mine adjoining it—I forget the name of it—a large mine.

Judge DEY.—Q. The Honorine?

A. The Honorine, yes, when they were running a tunnel there. I never was in the Mercur. I have been down in the Santaquin District and examined the Sioux Chief, which is only a small property, but it is in a very interesting geological relation to Tintic. In Nevada, the most important investigations I made there was in the Pioche District, in the Raymond-Ely group, the old mines, as far as they are accessible, and in the Prince Consolidated, and the Susan Buster, all of which carry large ore bodies in rather unusual modes of occurrence. In Wyoming I have examined coal mines, the Rock Springs No. 1 from top to bottom, and the Kemmerer 1 and 2, I think.

Mr. BUDGE.—Q. Well, from your experience in the examination of these properties, and from the performance of your duties as State Mine Inspector, what have you to say as to your opportunities of acquiring information as to the nature of the deposits in these various places throughout the west, and as to the manner of occurrence of these deposits? [816]

A. I think I have had exceptional oportunities for observing the modes of occurrence of ore bodies. In fact, I think the States I have mentioned, in which I am more or less familiar with ore deposits, contain some of the finest examples of ore deposition that is to be found anywhere in the world.

(Testimony of Robert N. Bell.)

Q. And your association has been in a great measure with geologists? A. Yes.

Q. And mine inspectors?

A. Yes. It rather involves considerable knowledge in a general way of the subject, to be able to publish a report that will be intelligible to miners and laymen, and sometimes to criticize the mistakes of more professional people, where they interfere with the practical phase of the question.

Q. Now, Mr. Bell, calling your attention to the deposits of phosphate rock, or of rock phosphate, included within the boundaries of the claims shown on Defendant's Exhibit 2 and Plaintiffs' Exhibit 1, I will ask you whether you have ever made an examination of these deposits?

A. Yes, sir. I examined these deposits in question, the first time on the 24th of May—the 24th or 25th of May, of this year.

Q. Any other time?

A. One day after that. I will have to look at my note-book.

Q. The 16th of June, wasn't it?

A. The 16th of June, yes, that's right—the 16th of June.

Q. What was the nature of the examination you made? [817]

A. Why, I went in company with Mr. Taylor and Mr. Weeks to the Waterloo mine, and went through the development of it first, and after that over the outcrop of the deposit its entire length, as far as it can be traced on the surface, from the Waterloo mine

(Testimony of Robert N. Bell.)

to the north end of the property—very nearly to the north end of the last placer claim in the group, and beyond the north end of the Obed lode claim.

Q. And what sort of an examination did you make?

A. Why, quite a careful examination of the underground feature of it, by reason of the fact that it was my first visit to it and the first time I had seen that character of mineral in a developed form underground.

Q. Did you study the mode of occurrence?

A. Yes.

Q. And position of the deposit?

A. Yes. We entered the mine from the lower opening, a cross-cut tunnel about 125 feet long, of which probably 100 feet was in solid formation, the outer 25 feet being in surface debris, that was timbered through, and the 100 feet in this cross-cut tunnel was a succession of alternating layers of shale and lime and phosphate material, to the bottom. Also, next to the lower limestone bed there was a five-foot bed of clean phosphate rock, of oolitic structure, with a decided band of black lime, highly fossiliferous overlying it, standing at an angle of about 30° and with a strike north and south and a dip west. It had been opened by entries driven north and south several hundred feet each way. I went to the face of both entries, and the men were still drifting east—two men [818] working in the face, one of them was drilling holes with a breast augur, such as is used in a coal mine. The structure of the five-foot bed of phosphate was very similar to a bed of coal—a pitch-

(Testimony of Robert N. Bell.)

ing vein of a bed of coal. It had a kind of a laminated or shaly structure, due to the deposit lines of the mineral or some subsequent compression, a very smooth roof and floor, and an occasional rounded creation or niggerhead, which is a common occurrence in a coal vein. The mineral was black, and the walls were black, and it looked very much like a coal vein. In fact, going through there, before the examination was completed, it recalled very vividly the only coal development we have in Idaho. We have a five-foot coal vein in Fremont County, a pitching vein, with roof and floor of sandstone, in a cretaceous series, on the west side of Teton Basin, that is opened by a similar cross-cut tunnel and has got an entry driven each way from the cross-cut tunnel, 500 feet and excepting for the lack of luster in the mineral it looked very much the same.

Q. Are you personally interested in that coal mine?

A. I am, yes, sir. I have been endeavoring to develop it for several years. We went to the south face first, and then back past the cross-cut entry tunnel, to the north face, and noted one or two rooms that had been started up on the pitch of the bed, and two raises or chutes through which the material had been brought down from a higher level. At the north end—

Q. This is the phosphate bed you are describing now?

A. The phosphate bed I am back on now. You asked me that.

Q. Yes—that's right. **[819]**

(Testimony of Robert N. Bell.)

A. At the north end of the Waterloo development, in the lower tunnel, a new raise had just been put through to an upper tunnel or entry, and we climbed through that raise or rock chute, or whatever you would call it, and found ourselves on the upper level or entry. That proved to be about 450 feet long, which we followed out to the surface, where it had been driven in from a point at a quarry, where the mineral had formerly been quarried on the surface, by stripping off the overburden of earth. This upper entry had several rooms driven up on the pitch of the bed, with short pillars left above the entry to protect it and save timbering, and the material had been mined out, and the roof propped as they do in coal mines, to prevent the falling of rock. At the mouth of the upper entry the bedded structure of the deposit is very well defined, and disclosed by considerable work of cutting and stripping for quarry purposes, which had exposed quite a little segment of the series. Also, the underlying limestone had been cut into, and showed a very excellent section of the main phosphate bed—the five-foot bed—with a rather massive underlying limestone, showing some weathered outlines of fossils in the five feet of phosphate rock of oolitic structure, and in two feet also—20 inches to two feet of very fossiliferous limestone, which they called the cap lime, that overlies the five-foot bed, and was conspicuously full of colored fossils, which on the under side of the bed made impressions in the upper layers of phosphate rock. From there we climbed up through the area that had been quarried, and which I

(Testimony of Robert N. Bell.)

was informed had produced about 5,000 tons of phosphate rock, and examined the stakes of the Maury lode claim, I think.

Q. Now, calling your attention to that area within the [820] Waterloo mine that has been mined, and which is now propped up as you have described; what is the approximate area, Mr. Bell?

A. That has been roomed out?

Q. Yes. A. Above the upper entry?

Q. Yes.

A. Oh, we didn't climb to the back of the rooms, you know. I should judge, though, that the total area—there are several of those rooms had been started up, and back of the entry all the way along is mostly ceiled—they have left a pillar there to protect the roof—

Q. I am talking about that portion of it that opens out—well, it really doesn't open out, but there is an aperture from the part that is mined out, out into that place where there has been quarry work done.

A. Well, I should judge that, at a guess—I didn't go through it; you couldn't get through—there might be 100 feet square.

Q. Mr. Bell, from your experience, do you claim to be familiar with the different methods of mining?

A. Yes.

Q. In the State of Idaho, and Western States?

A. Yes, sir.

Q. And with the method of treating ores?

A. Yes, sir; in a general way.

Q. And minerals? A. Yes.

(Testimony of Robert N. Bell.)

Q. Now, did you, on the 16th day of June, 1911, in company with Mr. Weeks, go over this ground embraced within the boundaries [821] of these claims as shown on Defendant's Exhibit 2, to ascertain the position of the highest exposure of the phosphate bed? A. Yes, sir.

Q. And calling your attention to the Defendant's Exhibit 2, I will ask you to state whether this black line correctly indicates the position of the outcrop of the beds at the highest points?

A. Yes, sir; I think it does. I went over that particular feature of the property with Mr. Weeks and Mr. Breger, and examined every one of the pits exhibited on the black line. There were little spots or places where the deposit had been opened by shallow pits, cuts or tunnels, and we traced that outline as it is shown there, which would really steal the apex right of one-third of the Obed claim, if it were located as a lode.

Q. Well, how do you account, Mr. Bell, from your examination of this area shown on this map exhibit 2, for the irregularity of this black line which indicates the outcrop?

A. Why, it is due to the folding of the strata and its subsequent erosion in an irregular manner.

Q. Now, calling your attention to this feature of it, from the Obey lode and the Wilmington placer to the Overton lode, the Cumberland lode, and down in the Winter placer; in what direction does the slope of the hill extend, does it extend from the Obey lode down to the Overton, or from the Overton the other way?

(Testimony of Robert N. Bell.)

A. It extends from the Obey lode down to the Overton. [822]

Q. In other words, the Obey lode and the Wilmington placer are higher up on the mountain than the Overton and the Cumberland, that are down on the creek? A. Where is the Overton Placer?

Q. Right here. (Indicating.)

A. Oh, yes. Oh, yes; they are seven or eight hundred feet higher, vertically.

Q. And on the other side of the map the Wizard placer is higher to the east than the Mount Pleasant lode? A. Yes.

Q. Now, what is the strike of this bed?

A. It varies a very trifle from the true north and south strike, at the north end of the properties shown, and the dip is quite uniformly to the west.

Q. Now, were you back on this map—or where appears on this map, rather, the curves of the black line extending toward the east? A. Yes.

Q. How do you explain those curves, as showing the outcrop, for example, as it appears running from the Arkansas lode down into the northeast corner of the Mount Pleasant lode?

A. That is due to the erosion of a tributary draw that runs into Montpelier Creek, and leaves on the swell between the draw and Montpelier Canyon rim a flat area with very little cover on of the five-foot phosphate vein.

Q. Now, calling your attention to the curves in this line which extend towards the west, such as the curve opposite the figures 2537, and the curve opposite the

(Testimony of Robert N. Bell.)

word "Hickman," and the curve opposite the figures 2538 on the Arkansas lode; and also [823] at this point, the curve opposite the figures 2538, as they appear in the Mount Pleasant lode; what do those curves extending westerly represent?

A. They are due to the inequalities of the outcrop, as caused by erosion of several different draws leading into Montpelier Canyon.

Q. These curves represent where the phosphate now runs?

A. Where the phosphate outcrops, to the edge of the bed in some instances, and to the other a fair representation of the apex.

Q. And the curves extending in towards the west from the Arkansas and Hickman lodes represent where the phosphate bed has been eroded, as I understand it?

A. Yes; those curves extending to the west represent the lowest points in the gulches or draws. Here is one on the line of the Tennessee lode. (Indicating.) The Tennessee lode seems to be laid out with the dip of the bed, and its side lines would be its end lines, and the extralateral feature would not amount to anything in that way.

Q. Now, I will ask you: Did you examine the boundary lines of these lode claims—the stakes?

A. A great many of them, yes. We haven't the numbers on the blue-print map, which was a copy, I think, of the Plaintiffs' Exhibit No. 1, isn't it?

Q. Yes, exhibit 1. A. Yes, exhibit 1.

Q. Well, from the examination you made there,

(Testimony of Robert N. Bell.)

were you able to observe the corners of these various lode claims? [824]

A. We visited several of the corners, and followed the outline of the bed over these claim lines, as shown.

Q. Did you follow the outcrop of the bed with particular reference to the corners and side lines of these lode claims?

A. Yes, sir. Pardon me, we didn't visit all the stakes of these lode claims; but the ones most involved we picked up, and found the numbers and location of them, and it is an open country and we could see the other stakes of most of the claims.

Q. Now, calling your attention to this curved line as it appears on the Arkansas lode, extending westerly by these various curves and angles down into the Mount Pleasant lode; calling your attention to that entire black line, I will ask you to explain the topographical condition there.

A. There are two draws—they can hardly be dignified by the name of gulches, because they are not deep enough, but they are deep enough so that they have eroded the phosphate series through to the underlying massive basalt line, the depth being anywhere from 100 to 200 feet.

Q. Describe where these gulches are, and designate them on the map so they can be understood in the record.

A. Well, one of them (the Tennessee Gulch, so named) lies between the south end line of the Arkansas lode and the north end line of the Hickman lode, and runs down the course of the Tennessee lode. The

(Testimony of Robert N. Bell.)

next draw is much shallower, and it runs more directly into Montpelier Canyon. It crosses the corner, or rather it runs down along the north end line of the Arkansas lode and across the Mount Pleasant. And in addition to that there is a little draw comes up in the center of the Mount Pleasant claim, which accounts for this exposure here (indicating), [825] there being more erosion back in here. (Indicating.)

Mr. JACK.—When you say "here," Mr. Bell, the stenographer doesn't get it.

A. That is true, too. I beg your pardon. There is a little draw runs back in towards the northeast side line of the Mount Pleasant lode, which exposes the bed where it has been eroded by that draw and by the main slope of Montpelier Canyon.

Mr. BUDGE.—Q. Now, this piece of county embraced within that crooked line that I have named, is a hill, isn't it, Mr. Bell?

A. Yes; it is a part of the main Waterloo ridge there, or range.

Q. And in what way does that bed extend or dip, from where this line appears on the Arkansas lode?

A. It dips down in a direction parallel to the end lines of the Arkansas lode claim, and comes to the surface on the Mount Pleasant claim, as exposed by a series of cuts and outcrops.

Q. At a point how much lower down the hill does this exposure occur on the Mount Pleasant lode?

A. From the apex of it on the Arkansas lode?

Q. Yes?

(Testimony of Robert N. Bell.)

A. Why, I should say 1500 feet, a little more, towards the west end.

Q. Now, is there any other exposure of phosphate rock on the Mount Pleasant lode other than as mapped out in this map? A. I believe not.

Q. Did you see any other?

A. I didn't see any other. [826]

Q. And which way does that deposit extend from this point where it outcrops, in which direction?

A. It has been cut out entirely on this dip from the line shown, and it would extend uphill towards the Arkansas lode.

Q. In other words, there is no deposit of phosphate rock below that line dipping toward the creek, down the hill? A. I don't believe there is.

Q. Well, the dip of that bed, from your examination, was in which direction? A. To the west.

Q. Now, how are these lode claims—that is, to the west and uphill, or downhill?

A. Oh—the dip of the Mount Pleasant?

Q. Yes.

A. Well, that would incline uphill, to the northeast. Am I right about northeast there? No—southeast.

Mr. JACK.—No—southeast.

A. Yes, it is southeast. The map is lying on its side to me.

Mr. BUDGE.—Q. Calling your attention to these lode lines and lode claims, and the manner in which they are laid out and located, how are they located with reference to the strike of that deposit?

A. There is not a single claim that is laid out ex-

(Testimony of Robert N. Bell.)

actly on the strike excepting the Hickman; the others vary at considerable angle, and some of them along the dip rather than the strike; that is the one in particular, the Tennessee.

Q. The Tennessee is along the dip, you say? [827]

A. Yes.

Q. And how are they located with reference to the dip?

A. They quarter across the direction of the dip, most of them. The dip is west, and the claims are laid out on the northwest side of the Montpelier Canyon, in a northeasterly direction, and would involve considerable apex trouble unless they were amended and properly made to conform with the dip of the bed, if they ever proved to be valuable.

Q. Do you understand, Mr. Bell, from your experience, what is known as a vein or lode?

A. Yes. My impression or understanding of a vein or lode is a deposit of metallic mineral matter that has been injected into a pre-existing fissure or fracture in the earth's crust, and primarily derived from subterranean sources.

Q. You say that is an impression. Is that—

A. That is my experience.

Q. That is what you understand to be a lode or vein? A. That is what I understand; yes.

Q. And what do you understand to be a placer, Mr. Bell?

A. A placer is a deposit of mineral matter, loose or consolidated, under the construction of the law,

(Testimony of Robert N. Bell.)

that may be valuable for gold or tin or earthy minerals of various descriptions; also for gems and hydrocarbons.

Q. What is the difference, as you understand it, between the methods of deposition of a placer and a lode?

A. My understanding of the deposition and origin of a lode deposit is, that it is due to igneous action of some kind, as a result of a primary fracture in the earth's crust being [828] filled by mineral matter brought up from the interior of the earth,—

Q. And as to a placer?

A. —into its present position or envelope, which already existed before it came there, and is consequently a mineral matter, a stranger to its enclosing formation. As to a placer, I consider a deposit that is produced by surface precipitation, in cold water, by mechanical concentration of the action and motion of water and other forces, and afterwards became valuable as a whole or for its contents, regardless of whether it is solidified or not.

Q. Do you know in your experience of any lode or vein which is mined for the mineral contained within the fissure as a whole; or is it necessary to resort to a process of extraction?

A. Lode deposits are usually any combination of ore and gangue, which has to be mined together, and subsequently separated by milling or smelting to extract the metallic contents for which the operation is generally carried on.

Q. In your experience as a practical miner and

(Testimony of Robert N. Bell.)

prospector, mine valuer, and inspector of mines, do you call this phosphate deposit a vein or lode?

A. No; I should not call it either.

Q. Would you call it a vein at all, Mr. Bell?

A. No. I should call it a bed.

Q. You say it has a strike? A. It has.

Q. And a dip? A. Yes. [829]

Q. And is it rock in place, Mr. Bell?

A. Yes.

Q. How would this material be mined, to mine it in the most economical manner?

A. Why, the most economical manner of mining it would be to mine the ore that has a thin layer of covering on them, by stripping and quarrying it, and subsequently by cross-cut tunneling, and driving entries along the strike of the bed, and working it on the long wall method of coal mining, just like you would work a coal deposit. It is a similar proposition.

Q. In your opinion, Mr. Bell, as a practical miner, would the ordinary prospector take this deposit, from its physical appearance, to be a lode or vein?

A. The definite evidence already submitted is that the ordinary prospector would take it for a coal vein, and actually did take it for a coal vein, and endeavored to develop it as such. Not only that, I am advised that—in fact, I know other prospectors in the Teton country who have located the same horizon as a coal vein, mistaking it for a coal vein; and I am informed that the original Hayden Survey that went through that country marked areas of coal which

(Testimony of Robert N. Bell.)

have since then been recognized as the same phosphate horizon.

Q. Coal, Mr. Bell, is a bed, is it not?

A. Yes; it is a sedimentary deposit, an accumulation of vegetable matter on the surface of the earth, subsequently covered.

Q. And it differs from a vein as you have described it?

A. It differs from a vein or lode of metallic mineral, decidedly. [830]

Q. There are places, then, Mr. Bell, as I understand you, where this deposit would be mined by a quarry method? A. Yes, sir.

Q. And that would be the only practical method?

A. That would be the only practicable method of mining those shale areas between these draws where there is not much cover on it.

Q. Are you familiar with deposits of building stone, limestone, gypsum, cement, and so on?

A. Yes, sir.

Q. In what places?

A. Well, we have some very excellent building stone quarries at Boise. The state owns one, and there are several private individuals own them, that is quite extensively used for building purposes, a rather flat, tipping bed of coarse sandstone; and there are a number of small quarries of volcanic tuff used for building stone. Along the border of the upper Snake River Valley, in the Horseshoe Basin in the Teton country, we have some excellent deposits of cement-making material, including quite pure limestone, and

(Testimony of Robert N. Bell.)

pure shale. The same thing occurs in Bonner County, on the Lake Pen d'Oreille, where it is being mined and used for cement and lime manufacture.

Q. Have you seen all these deposits?

A. Yes, sir.

Q. How do they compare with this deposit of phosphate rock, as to their dip and strike?

A. Why, the sandstone deposits at Boise are flatter; the cement and lime deposits at Lake Pen d'Oreille stand at an [831] angle, as I remember, all the way from 45° to 60°; and these limestone deposits in coal veins at Teton Basin stand at an angle of 45°. In other respects the bedded structure is generally similar to the phosphate series.

Q. Have they a bed and roof of solid rock formation?

A. The different layers of limestone have; the one layer will form the roof of another, and the one below it will be the floor of that immediate layer.

Q. Well, are the upper—are the covering or cap lime and the basal lime of different quality and structure?

A. In the coal deposit of Teton Basin that is true; the underlying lime is rather silicious, with a good many segregated lines of silica in it; and the overlying formation is shale.

Q. The overlying formation, you say, is shale?

A. Over the good bed—the silicious bed, then a bed of pure lime about 50 feet thick, then a bed of shale of say 25 feet thick.

Q. And these beds are in place in the mountain?

(Testimony of Robert N. Bell.)

A. Yes, as much in place as they are in the property in question; they have been folded in a similar manner, only a little more intensely.

Q. How extensive are these beds of limestone?

A. Oh, they extend—they are exposed in sight for about a mile, along the face of the cliff.

Q. For what purpose are they mined?

A. They are not mined at present.

Q. They are not mined? [832]

A. No. The coal is mined below them, and it is sold for the purpose of fuel to the farmers around there.

Q. Calling your attention to these cement deposits, are they mined now? A. Yes, sir.

Q. And what is the stratification that is in evidence where these beds are exposed?

A. Why, the stratification there is a wide series of lime beds probably—I haven't got the exact dimensions, but I should say a mile wide, of pretty pure gray lime, overlaid by a series of shales and slates a mile wide, in conformable order, and underlaid by a series of quartzites, the whole forming the upper horizon of the belt series of sediments.

Q. Of a sedimentary nature?

A. Yes, metamorphosed sediment; they have been somewhat altered.

Q. Have they a dip and strike? A. Yes.

Q. And what is the dip?

A. It varies up to as high as 60°.

Q. And are the boundary lines or planes between these several beds well defined, or otherwise?

(Testimony of Robert N. Bell.)

A. Between the formations I have mentioned they are well defined—between the shale and the lime, and the lime and the quartzite.

Q. Let me understand you; how deep did you say this shale was, Mr. Bell?

A. Oh, the series of shale is probably a mile thick.

[833]

Q. A mile thick? A. Yes.

Q. And the lime?

A. Of similar thickness; and the underlying quartzite series, which varies in texture from pure quartzite to shaly quartzite, varies in textures of quartzite. That is 30,000 feet thick, known as the Coeur d'Alene series.

Q. Have any other deposits of a similar nature came under your observation?

A. Yes. There is a bed of gypsum in Idaho, about six miles below the Huntington bridge on the Oregon Short Line, on the Idaho side of the Snake River, about ten feet wide, with a roof and floor of blue slate.

Q. And how wide—how thick are these layers forming the roof and floor?

A. The upper layer above the gypsum bed I think is probably 50 feet, and the one below exposed for 25 to 50 feet. The exposures are not regular; they are covered more or less with debris, and it is not easy to determine.

Q. Is the line of demarcation between these several beds well defined, between the gypsum and the floor and the roof?

(Testimony of Robert N. Bell.)

A. Yes; the roof and floor both are well marked, and quite smooth.

Q. And has this gypsum bed a dip and a strike?

A. Yes, sir.

Q. What is the dip?

A. I am not sure. I think the dip is about 40°, and the strike northwest and southeast. [834]

Q. Are you familiar with the manner of locating different classes and characters of deposits?

A. Yes.

Q. How are gypsum beds and building stone deposits located?

Judge DEY.—Oh, I object. There is a special law for building stone.

A. They are located as placers, and properly patented as such.

Q. And that is true of both of them, is it?

A. Yes.

Q. Do you know of any sedimentary deposit in Idaho, lying within well-defined walls of rock, that is located as placer? A. Yes.

Q. Where is it?

A. Well, on Bear River we have some conglomerate gold-bearing gravel beds that rest on a granite bedrock, and have a roof of black basalt lava. It is a sedimentary bed in that sense.

Q. What is the overlying rock? A. Basalt.

Q. Basalt? A. Yes, sir.

Q. Is that a deposit on—black deposit, also, on Moore's Creek?

A. Yes, there is a similar deposit on Moore's

(Testimony of Robert N. Bell.)

Creek, and on Bear River, a capping of basalt 20 feet to 50 feet thick, and the one on Moore's Creek as much as 100 feet thick. They have been cut through by subsequent erosion, and the bed of gravel [835] exposed under it, and it has since been mined by tunneling.

Q. From your experience as a practical miner, Mr. Bell, how would you consider the phosphate rock in question should be located?

A. By reason of the unquestionable evidence of its sedimentary nature, practically unaltered since it was formed, I should consider that it ought to be properly located as a placer; and for the further reason that it is a nonmetallic mineral; simply a consolidated natural manure, and its chief use in commerce would be for that purpose, for fertilizing land.

Q. What do these fossils indicate to you as a practical miner, as to the method of deposition?

A. They indicate that the material was deposited on the floor of a shallow sea. They are apparently marine fossils; they have been classified as such, and show very clear and distinct forms, which have remained unaltered since they were deposited there.

Q. And what have you to say as to whether these fossils are abundant or otherwise?

A. They are extremely abundant in the narrow bed of cap lime overlying the five-foot bed of phosphate, so much so that it is readily identified, at every opening where the bed has been cut, from one end of the property to the other, as far as I examined it, and its identity is readily recognized; which is also

(Testimony of Robert N. Bell.)

true of the fossil impression of the cherty overlying limestone beds that cover the phosphate series; they are characterized by another type of fossils of larger form, which seem to be persistent as far as that bed is exposed. [836]

Q. Did you examine at any time the claims shown on Plaintiffs' Exhibits "A" and "B," commonly known as the Wyoming claims, in Raymond Canyon?

A. No, sir; I have never been over them.

Q. You have never been over them?

A. No, sir.

Cross-examination.

(By Mr. JACK.)

Q. Where are these fossils found which you speak of—in what part of the series?

A. In the cap lime, immediately covering the five-foot phosphate bed.

Q. Do you find them in the bed of phosphate itself?

A. They show impressions where they stick out of the cap lime into the phosphate material.

Q. Where the fossils were upon the top of the underlying stratum, or on the under side of the upper stratum—

A. —they left slight impressions into the phosphate material of the bed.

Q. You say this is a valuable mineral substance—this deposit? A. For—

Q. For some purposes?

A. For some purpose, yes—non-metallic purposes.

Q. The phosphate in the material is what renders it valuable for its fertilizing qualities?

(Testimony of Robert N. Bell.)

A. The combination of the phosphate and the calcium carbonate. [837]

Q. Yes; but the phosphate added to the carbonate is what gives it its value? A. Yes.

Q. Did these fossils or the animal and marine life that was probably in the water at the time the stratum was formed, have anything to do with the source of the phosphatic material in this bed, do you think?

A. It is very probable that they had. That could be one possible source of the origin of the phosphate material.

Q. That is, as the lime was being laid down, your idea is that it was covered with water, and it was laid down in the shallow ocean? A. Yes.

Q. And in this water were probably marine life—marine animals? A. Yes.

Q. Or vegetable matter, and they contained fossils— A. —phosphates, in their strict—

Q. —and being decomposed would release the phosphate, so that it united with the—

A. —precipitated with the lime carbonate.

Q. And precipitated on the bottom of the ocean?

A. Yes, sir. That is one possible source.

Q. That would seem like a reasonable explanation of it—a constant leaching of the phosphate from the marine life, mingled with—

A. Not a leaching—a rotting of the bodies of the animals. [838]

Q. Yes, that released that phosphate?

A. Released the phosphoric acid.

(Testimony of Robert N. Bell.)

Q. And it settled down upon the lime under it, on the bottom of the water, wherever it was deposited?

A. Yes. On the other hand, those marine animals may have formed food for birds, that accumulated extensive layers of guano on the shores of that ocean bottom, which subsequently was dissolved and transferred into the ocean water by surface streams, and then precipitated into the lime forming sludge at the bottom.

Q. Then, that released phosphoric acid from this life, united with the calcium that was on the bottom of the ocean? A. Or in the water.

Q. Or in the water, and formed the calcium phosphate? A. Yes, that is one, probably—

Q. And that is the ingredient substance as we have it in this deposit now?

A. Yes, sir; that is one probable form of its origin.

Q. Will you give me your definition of placer again?

A. I consider a placer an accumulation of sedimentary material on the surface of the earth, brought about by action of—mechanical action of cold surface water, and at the present time may be loose or solid, but valuable for commercial uses or the metallic contents which it may contain.

Q. And the substance carried from its original position and deposited on some other portion of the earth's surface?

A. Yes; that would be part of my definition—an accumulation of material from some other source, by surface action, or marine action. **[839]**

(Testimony of Robert N. Bell.)

Q. You have spoken about building stone, gypsum, and sandstones; are they placers?

A. Yes, sir; they are properly located as placers, according to my understanding of the law.

Q. And do they come under your definition of a placer?

A. They come as coal on the surface of the earth, or on the bottom of the sea.

Q. Then, is every sedimentary rock a placer?

A. If it had a commercial value as such it could be located as a placer. Any other sediment would be as eligible for location as a placer as limestone is.

Q. You have made a great many locations during your experience as a miner?

A. Yes, I have, in a good many years.

Q. Did you make any ledge locations?

A. Yes, sir.

Q. What determined you as to the character of the location that you would make?

A. Whether I would make it as a lode or a placer?

Q. Yes?

A. Well, in my early experience Copp's Handbook usually determined me. If it described—if it contained metallic mineral I would locate it as a lode. If it had the other necessary requirements, and if it was loose material, or if it was a gem deposit, either loose or in the form of a dike or fissure vein, I would have located it as a placer.

Q. What location did you ever make—ledge location?

A. I located an igneous dike of rhyolite, with

(Testimony of Robert N. Bell.)

walls of andecite and breccia, containing gem opals; and there is a [840] specimen out of the property, if you care to look at it. (Handing same to Mr. Jack.) I have located copper mines and gold mines.

Q. Where did you make copper mine locations?

A. I made the original location in the Blackbird Copper District, which was afterwards quite extensively developed by John E. Dubois.

Q. Where did you make the gold ledge location?

A. Oh, in half a dozen places; one in the Leesburg Mining District known as the Haidee.

Q. Was that free gold? A. Yes, at the surface.

Q. Was the gold clearly discernible in it, when you first discovered it, at the surface?

A. Well, yes, it was. By careful selection I could find little cubes of hematite, showing specks of gold.

Q. And you found that before you made your location?

A. Yes; I found the vein before I made the location.

Q. You found specks of free gold in the rock before you made your location? A. Yes.

Q. In the copper location that you made, was the copper clearly discernible in the first specimens you found? A. The copper oxide mineral was, yes.

Q. You could tell from the looks of it—

A. Yes.

Q. —what mineral it contained? A. Yes. [841]

Q. Did you ever locate any rock in which the mineral you were seeking was not clearly discern-

(Testimony of Robert N. Bell.)
ible—that you didn't know what it contained?

A. Well, no; I can't say I have located rock that contained mineral that I did not suspect, but it always had some mineral in that I recognized. For instance, in the Blackbird District discovery I located that property as copper ore, and it subsequently proved to contain both nickel and cobalt, but I had had no previous experience with those minerals up to that time, and didn't recognize—

Q. Suppose the copper had not shown in there; how would you have determined what class of location to make?

A. By the form in which it occurred.

Q. You mean the position it occupied in the earth?

A. In the earth, yes, together with the condition of its walls, or envelope containing the formation.

Q. Taking this cobalt ore which you could not determine by looking at the specimen, how would you know whether to make a ledge or placer location?

A. Because it had copper minerals in it that were very readily recognized.

Q. I say, without the copper mineral so that you could detect it?

A. Well, then, without the copper or cobalt or nickel, it had certain forms of crystals—

Q. I am not referring to that particular one. Suppose you had the ore in which the mineral cobalt and other minerals were not readily determined by visual inspection of the specimen, what would you

(Testimony of Robert N. Bell.)

have to guide you as to what kind of a location [842] to make?

A. The condition of the country rock. Most lode or vein deposits have influenced the country rock in a way that has changed its appearance. The solutions that have come in to form that lode deposit have leached the country rock, as a general thing, close to the walls, and changed its texture or color.

Q. Then, you would go by the position it occupied in the surrounding country and the appearance of the rock? A. The enclosing formations, yes.

Q. And if it turned out that the valuable mineral therein contained did not come from subterranean waters, your location would be invalid?

A. Not necessarily.

Q. Didn't you say a ledge must be filled from subterranean sources? A. I said originally.

Q. Originally? A. Yes, sir.

Q. And if it turned out that it was not originally filled from subterranean waters, would your location be invalid?

A. It could not be filled in any other way.

Q. Couldn't it come down from above by concentration leaching it from surrounding rocks?

A. Well, it would have to come up first, if it was lode mineral.

Q. Not necessarily in this fissure?

A. This particular fissure? No, but in some other [843] fissure, and the influence would be shown on this fissure, and this fissure would be there to receive it.

(Testimony of Robert N. Bell.)

Q. In other words, before you could make a ledge location you must know the source of the filling matter, must you?

A. Well, you must have a pretty good idea of it. You can tell whether it is the lode source or placer source, for the reason that the lode material is almost invariably metallic or crystalline in some form, and the sedimentary is unaltered, very seldom crystalline.

Q. How about the placer deposit you speak of up on the Boise River; isn't that a metallic substance?

A. The gold is metallic that is in it.

Q. And that is the substance that the miner is after, isn't it? A. Yes, sir.

Q. And that is what he makes his location on?

A. Yes, as a placer.

Q. Then, how does the metallic contents affect the ledge or the placer location, determining that?

A. Well, if you found a deposit that was useful for something other than the extraction of metal, and of sedimentary origin, that would determine its nature, that it was not a ledge, I should think, from the general construction of such matters.

Q. As a matter of fact, Mr. Bell, doesn't every miner determine upon the nature of his location from the occurrence, the position it occupies in the earth, and the nature of the rocks surrounding it?

A. No. If the miner—if he knew that this was manure [844] he would not locate it as a ledge, I don't think.

Q. Suppose he didn't know it was a manure?

(Testimony of Robert N. Bell.)

A. If he didn't know it was a manure he wouldn't know that it would have any value at all, because it doesn't show that it has any evidence of metal.

Q. The first locations of this deposit was made how? A. As placer, I believe.

Q. And when they took them as coal—when they supposed they were coal? A. As coal, yes.

Q. Did that make a placer deposit, to take it as coal?

A. Well, they took a claim equivalent to placer, a deposit or claim with definite boundary lines, vertical lines, all around.

Q. What do you mean—the equivalent of a placer deposit or placer location? A. Sir?

Q. What do you mean by equivalent to placer location? Is there any equivalent for a placer location?

A. Well, when I say "equivalent," I mean the recent decisions have made deposits of natural gas and oil several thousand feet deep in the solid strata of the earth locateable as placers.

Q. What decision?

A. I haven't any definite references, but I think Mr. Budge can furnish you—

Mr. BUDGE.—Well, that is the law, I think.

A. —some law on that subject.

Mr. BUDGE.—That is the oil law of 1897.

A. And the same ruling or law has been passed in regard [845] to locating sedimentary deposits such as limestone, gypsum, salt, etc., as placers.

Mr. JACK.—Q. Yes, that's right Mr. Bell.

(Testimony of Robert N. Bell.)

Then, this building stone and coal and oil are located under special statutes upon those subjects, are they not?

A. I am not sure about that. I think, according to my memory of the placer law of twenty years ago, there were several substances besides metal-bearing rock, the nonmetal-bearing minerals that were located as placers, as I have stated, the gem deposits, whether consolidated or otherwise.

Q. Do you in making your mining locations go by the law or by geology?

A. Oh, I go by both. I would confine myself to the law, and take advantage of the best kind of law that was offered, that fit the deposit to the best advantage.

Q. Do you know what the provisions of the law are for making a ledge location?

A. Yes. It is first necessary to find a vein or lode; then you are permitted to—

Q. —of what?

A. Of quartz, or other rock in place, containing a number of designated metals.

Q. Is this rock in place? A. Yes.

Q. Containing minerals of value?

A. Mineral, but not metals.

Q. I say mineral of value? A. Yes. [846]

Q. I believe in your definition of a lode or placer you laid some stress on the use to which it is to be applied. Did you not make that one of the conditions?

A. Yes, I think probably I did.

(Testimony of Robert N. Bell.)

Q. If it were used for fertilizing purposes it must be located as a placer?

A. In view of the fact that that is a commercial purpose, like using limestone for refining sugar, I should think so.

Q. That is one of the determining factors, as to whether it should be lode or placer?

A. And the fact that it is nonmetallic.

Q. Then, your idea is that the substance for which the deposit is valuable must be metallic in character? A. To be located as a—

Q. To be located as a lode or vein?

A. That was my general conception.

Q. Is that your opinion now?

A. My opinion now is still the same, though I understand one exception has been made, to the location of Gilsonite in lode form.

Q. Of what?

A. A gilsonite deposit in a fissure vein.

Q. With the exception of Gilsonite, all other deposits must be metallic in nature?

A. Must contain metallic minerals, to be properly locateable as lodes, excepting the placer deposits of loose detrital material.

Q. You except those under a special statute?

A. Well, excepting the detrital deposits of material. [847]

Q. Well, what characteristic of a vein do these deposits lack, except the metallic character of the contents?

A. Why, the principal characteristics that they

(Testimony of Robert N. Bell.)

lack is a decided absence of a selvage separating the valuable mineral from the wall rock, together with the unaltered condition of the wall rocks, which remain practically as they were consolidated when they were laid down. If it were a vein or a lode those conditions would not be manifested in their original form; they would be altered by the action of acid solutions leading the rock, replacing it with silica, or dissolving it out and replacing it with something else, some other form of mineral, and there would be an altered condition of the primary sedimentation. But where it has those primary conditions—the unaltered fossils are still there the way they were laid down; the fossil rock, apparently, from its oolitic structure, shows the concentric wave action, of motion, of rubbing together of the grains, and the underlying basal limestone, where exposed at the surface, shows weathered outlines of fossil shells. I don't know of any lode or vein deposit that shows those unaltered conditions.

Q. The rocks below and above this deposit are clear and distinct from the phosphate beds, are they not? A. Yes, sir.

Q. And your idea is that these wall rocks must be altered in character, especially close or next to the deposit, in order to constitute a vein?

A. They almost invariably are, in a lode or vein deposit.

Q. Is it necessary that they should be?

A. It is to my mind necessary that they should be changed [848] from the original sedimenta-

(Testimony of Robert N. Bell.)

tion forming the walls or veins.

Q. You have visited Park City, you say?

A. Yes, sir.

Q. Are there sedimentary rocks there?

A. Yes, sir.

Q. Are the rocks below and above, or enclosing the ore deposits there, changed from their original form?

A. The rocks enclosing the ore bodies in contact with the ore are decidedly changed.

Q. What is the character of the rocks enclosing the main deposits there in Park City?

A. Limestone, quartzite, porphyry.

Q. In what manner is the quartzite changed?

A. It is hardened into a glassy surface, and being abraded, in some places an accumulation of talc has formed on it.

Q. For what distance from the ore body?

A. Varying distances; in some places there is a fault breccia selvage a foot in thickness, but generally narrow.

Q. Then, anything less than a foot is sufficient change?

A. Oh, yes; a fraction of an inch would be sufficient if it were the proper material. The limestones in the Daly-West are decidedly changed. The main bonanza bed at the 900 foot level showed two layers of rich sulphide of lead and zinc ore, with a thin bed of limestone in between, that had been almost completely digested into a white chalky substance, in parts of one of the main bonanza stopes I examined.

Q. If you find a deposit—

(Testimony of Robert N. Bell.)

A. Gypsum is found in true veins, and has beds.

Q. If you found a deposit of which you wished to make a [849] ledge or vein location, you attempt to locate the length of your claim with the strike of the vein, do you not?

A. Yes sir; that gives the—

Q. How do you get at the strike of the vein?

A. I find out the dip, and then take the opposite direction.

Q. You would not go by the outcrop?

A. I would go by several points of outcrop, if I could find them and found that they were conformable in one direction.

Q. But you would find the dip first?

A. Oh, it would depend on conditions altogether. I would try and find the strike, though.

Q. Which would you find first, the strike or the dip?

A. Well, the chances are I would find the strike first.

Q. And then attempt to locate your claim?

A. And then find out whether I had a vein or not; and then I would find out what my dip was; and from that I would get my strike true.

Q. What would determine the strike in making your location?

A. Why, uncovering the apex or outcrop of the vein, usually.

Q. And you would follow that as nearly as you could? A. Yes.

(Testimony of Robert N. Bell.)

Q. That is the way locations are always made, are they not?

A. Well, if the thing was already shown as this was, where the strike and dip was extensively exposed by workings, [850] there was no reason to locate yourself as you did there, I don't think.

Q. Is it your idea that these locations were made after the work was performed?

A. After a good deal of it was performed, yes, sir.

Q. How did you get that idea?

A. I got it from talking with Mr. Taylor, that the work—we examined a good deal of it—was done when these claims were made.

Q. He told you that the work was done before the locations were made?

A. Yes, before the lode locations were made.

Mr. JACK.—Just read the question I have asked first for him to answer.

(The Special Examiner repeated as follows:)

"Q. If you found a deposit which you wished to make a ledge or vein location, you attempt to locate the length of your claim with the strike of the vein, do you not?

"A. Yes, sir; that gives the—

"Q. How do you get at the strike of the vein?

"I find out the dip, and then take the opposite direction.

"Q. You would not go by the outcrop?

"A. I would go by several points of outcrop, if I could find them and found that they were conformable in one direction.

(Testimony of Robert N. Bell.)

"Q. But you would find the dip first? [851]

"A. Oh, it would depend on conditions altogether. I would try and find the strike, though.

"Q. Which would you find first, the strike or the dip?

"A. Well, the chances are that I would find the strike first.

"Q. And then attempt to locate your claim?

"A. And then find out whether I had a vein or not; and then I would find out what my dip was; and from that I would get my strike true.

"Q. What would determine the strike in making your location?

"A. Why, uncovering the apex or outcrop of the vein, usually."

A. Is that your question?

Q. Yes.

A. Well, what would determine the strike would be considerable work on the original discovery.

Q. But it would be made from the outcrop, would it not? It would be determined from the outcrop?

A. No, not with my present knowledge of the conflicts that are derived from extralateral troubles. It generally would not be determined from the outcrop —from the direction of the outcrop.

Mr. JACK.—Will you just repeat that answer?

(The Examiner repeated the last answer.)

Q. Generally it would not be? [852]

A. Not from the local direction of the outcrop, no.

Q. What would you determine it from?

A. I would take the dip into consideration, too.

(Testimony of Robert N. Bell.)

As a matter of fact the strike could not be obtained without taking the dip into consideration at several points on that group.

Q. On this group? A. No.

Q. I am speaking generally.

A. If you was out prospecting?

Q. Yes.

A. Well, as I say, I would have to cast around the discovery, as a Cornishman would say, and find out what the direction was, and what the dip was.

Q. As nearly as you could?

A. As nearly as I could, and lay the side lines and the end lines.

Q. And lay the side lines and end lines of your claim accordingly?

A. Accordingly; and if I couldn't get a full claim without running the apex of the vein through the end lines, I would take a short claim, so as to be sure that I had the extralateral rights of what I did take.

Q. The claims which you have examined, and which are shown upon Plaintiffs' Exhibit 1 and Defendant's Exhibit 2, have considerable work done inside of the lines of the lode locations, have they not?

A. Yes, sir.

Q. Do they show the mineral through there?

A. Yes, sir. [853]

Q. The black line that you examined, that is shown upon Defendant's Exhibit 2, approximates the footwall of the phosphate series?

A. Yes—of the five-foot bed.

Q. The dip is to the west and into the mountain, is it not?

(Testimony of Robert N. Bell.)

A. The dip is to the west and out of the mountain, from the Montpelier Canyon south.

Q. From the Montpelier—

Mr. BUDGE.—It comes down this way, and then jumps and dips in there.

A. The mountain is an anticline, with a slope to the west. The anticline thickens up going north from the mountain ridge, which constitutes the crest of the anticline—

Q. Did you say north of Montpelier Canyon, that it dips out of the mountain?

A. I say south of Montpelier Canyon.

Q. I was asking about the other claims north of Montpelier Canyon.

A. Oh, I thought you were asking about the whole exhibit.

Q. No.

A. I beg your pardon. North of Montpelier Canyon the—

Q. Just whether it is into the mountain or not.

A. Well, it dips out of the mountain on the north side of Montpelier Canyon, of the range as a whole. It dips into the side of Gertch Hollow, into the east slope of Gertch Hollow. It practically dips into the body of the west leg of the anticline. [854]

Q. Let me see if I understand you: Is the ground higher or lower to the west and north of the Montpelier Canyon?

A. Immediately west it is higher, but it is higher still to the east, so that you haven't got the crest there, you have only got a part of the mountain slope; but

(Testimony of Robert N. Bell.)

there is a hollow running down there which makes the bed, as you see, dip apparently into the mountain, but as a matter of fact it is dipping into the valley also.

Q. And south of Montpelier Canyon, at the Hickman lode, is the dip into the mountain or out of the mountain?

A. It is out of the mountain, according to the slope of the mountain, into the valley.

Q. Now, take the Arkansas lode: Do I understand you the black line shows the outcrop of the deposit?

A. Approximately.

Q. And the black line throughout the Mount Pleasant claim is the lower edge of that same deposit?

A. Yes, sir, where it has been cut out by Montpelier Canyon.

Q. So that the Arkansas lode apexes the Mount Pleasant?

A. Yes, that's it, exactly; it apexes all the mineral that is on the Mount Pleasant, unquestionably.

Q. What is the effect if a ledge location is not exactly with the strike of the vein?

A. Well, in several cases there it would lose considerable of its length.

Q. I mean in general. It would lose what?

A. Considerable of its length, wherever the deposit on the side line or end line would have to be drawn into that point. [855]

Q. And when you state that the placer claim, as I understood you, would steal a good part of the apex of the Obed lode, you mean simply that the vein runs

(Testimony of Robert N. Bell.)

out of the side line of the Obed claim; is that it?

A. No, I didn't say that. I said that if the lode location were made on this Wilmington placer it would steal a third of the apex of the Obed lode; but it doesn't cover the highest apex of the deposit.

Q. The workings that you spoke of that you examined are upon the Waterloo placer patented claim, are they not? A. Yes, sir, I believe so.

Q. There are no extensive workings on the others that you found?

A. Not very extensive. There were a number of short tunnels and open cuts and strippings.

Q. What is the deepest point on the strike of any of these deposits that you are familiar with?

A. The deepest point?

Q. The greatest depth on the dip, I mean.

A. Well, I consider the greatest depth on the dip of the deposit there outlined to be the southwest end of the Overton lode—not the southwest end, but down in there where those first cuts occur.

Q. Well, just give the distance, about, as nearly as you can estimate.

A. Well, from there to the highest point on the Wilmington placer on which the deposit is exposed, would be, at a guess—I didn't measure it—800 feet, and I think the dip is exposed [856] to that extent, for the reason that you can stand on the rim of Montpelier Canyon and see the—

Mr. BUDGE.—At what point, Mr. Bell?

A. About 100 feet from the northeast corner of the Mount Pleasant lode, on a bluff of the hard basal

(Testimony of Robert N. Bell.)

limestone, 200 or 300 feet above the creek-bed; and you can see the strike and dip of the deposit for a mile; you can see the strike, I should say, very distinctly, by the bold outcrop of the underlying limestone cliffs and the discoloration of the ground, and the development—the openings along the five-foot bed.

Mr. JACK.—Q. If the mineral contents of this deposit were lead, would this be a vein or lode?

A. The chances are it would; because the condition under which that lead would occur would be different from the condition under which this phosphate occurred.

Q. I am asking if the strike, dip, walls, and position in the mass of the mountain were exactly as they are now, and the valuable contents of the rock of this deposit were lead, should this be located as a vein or lode?

A. It is a physical impossibility for lead to occur without changing the condition of those walls.

Q. Without changing what?

A. The condition of the walls.

Q. You mean as to the effect upon it?

A. As to their present unaltered sedimentary appearance.

Q. But if the walls were changed to the distance of three inches on each side, would that make it a ledge or vein? [857]

A. It would be evidence that there was a fissure source for the metallic mineral solutions that had run into that bed or vein, like it does in Park City in

(Testimony of Robert N. Bell.)

places; and it would be properly locateable as a lode if those altered conditions were there.

Q. And if they were not there?

A. If they were not there the ledge or mineral would not be there, either.

Q. But if they were there and the walls were not?

A. It could not be there unless the walls were altered.

Q. Then, you refuse to alter that, Mr. Bell?

A. I refuse to admit that a lode mineral can be found in an unaltered sedimentary condition of that kind; that it had been washed in from the surface in placer form into a crevice.

Q. But if it were so—if such a thing should occur—would you locate it as a ledge or vein?

A. Such a thing could not occur, so I could not locate it as a ledge or vein.

Q. Do you know all the occurrences in nature?

A. I do not; but from the number I do know and the number I have read about in the different parts of the world, I do not believe that any lode mineral occurs without an accompanying alteration of its enclosing formation.

Q. You don't believe?

A. I never read of any.

Q. Do you know if it can be so?

A. I don't believe it can be so.

Q. I know you don't believe—you say you don't believe—but do you know it?

A. Well, I know it as much as I know that you have got a [858] heart in your body without seeing it.

(Testimony of Robert N. Bell.)

Q. That is the only way you know it? Are you familiar with the deposits down at Silver Reef, in Utah?

A. I have never been there. I have read about them.

Q. Isn't that in a sedimentary deposit?

A. A sedimentary deposit, accompanied by irruptive rocks, or fissures in the sedimentaries.

Q. Are there any instances of any kind in mines where metallic substances are in sedimentary rock?

A. Yes, lots of them. There is not a camp in Utah where the metallic substances are not more or less in sedimentary series.

Q. Then, why do you say that if this deposit were lead, or gold, or silver, between sedimentary walls, it would not be a vein or lode? A. I don't say so.

Q. Would it be?

A. It would be if the walls were altered by the introduction of those minerals.

Q. Yes, it would be if the walls were altered?

A. Yes.

Q. In other words, occupying the same position in the mass of the mountains as this does, and the substance of value were metallic, it would be a ledge or vein?

A. And the other conditions accompanying a ledge or vein were there, yes.

Q. By "other conditions" do you mean in the alteration of the wall rocks?

A. The wall rocks, yes. [859]

Q. If this were a fissure, in sedimentary rock, and

(Testimony of Robert N. Bell.)

filled with this phosphorite, or tricalcic phosphate, would it be a ledge or vein?

A. It would be a vein, but locateable as a placer.

Q. Locateable as a placer?

A. Yes, under my understanding of the matter.

Q. That is on account of—

Mr. BUDGE.—Just a minute. I would like you to understand that last question, please.

(The last question was repeated, as follows:)

"Q. If this were a fissure, in sedimentary rock, and filled with this phosphorite, or tricalcic phosphate, would it be a ledge or vein?"

Mr. JACK.—Q. On account of its nonmetallic character?

A. Being a nonmetallic mineral, and of comparatively low commercial value, like coal and other substances that can't stand the high expense of treatment.

Q. Then a nonmetallic substance, no matter what its treatment in the surrounding rocks or the mass of the mountains, is locateable as placer and not as vein?

A. No. You will have to except coal, and as I said, that one instance of Gilsonite.

Q. Well, that, as I understand you, is on account of special statutes on the subject?

A. I think so. As a general proposition, the placer application is given to mineral products of low commercial value.

Q. Gilsonite is not under special statute; but you are making an exception of that substance? [860]

(Testimony of Robert N. Bell.)

A. I think there was a decision that by reason of its unusual occurrence in the fissure it was allowed as a lode claim. But if that Gilsonite had been found as a bed, lying horizontally on the surface, covered or otherwise, it would properly have been locateable as a placer, and I think is located as a placer.

Q. In your examination of the workings upon the Waterloo patented placer, you spoke of encountering niggerheads? A. An occasional niggerhead, yes.

Q. By that you meant a bunch of country rock, or foreign rock?

A. No. It is a concretion of foreign material like. It is a common occurrence in a coal vein.

Q. Not valuable material?

A. It is not valuable, and not very common. It was only a rare occurrence.

Q. And in mining this substance and marketing it, you just throw this to one side as waste material?

A. Yes. The total accumulation of what they had thrown outside, out of that 5,000 tons mined, I don't believe would exceed five tons; so it was a negligible quantity. The bed was almost pure.

Q. In determining the outcrop of the phosphatic series, and which is indicated by the black line upon the Defendant's Exhibit 2, did you walk over that outcrop the entire distance covered by those claims?

A. The entire distance from the Waterloo placer north, throughout its meanderings, to the point marked "B" on the Wilmington placer. [861]

Q. Well, that is practically the entire distance, is it not?

(Testimony of Robert N. Bell.)

A. Practically it is the entire distance, with the exception of the three or four lode claims on the south end.

Q. Was that outcrop clear and defined, so that you could see it all the way along?

A. The outcrop was not clear and defined so that you could see it every inch of the way along; but we could follow the outcrop with short exceptions by the color of the ground where it was not exposed by cuts, or where we could not follow it from one cut to the other.

Q. Can you point us any place along this dark line where there were these few intervals of unexposed outcrop? A. Yes. There is one. (Indicating.)

Q. Well, just take a lead pencil and mark a couple of marks at those various points.

A. There was a point there. (Indicating.)

Q. Take the lead end.

(The witness marked the place indicated.)

Q. Now, you have marked with lead pencil the only points where the outcrop is not clearly in evidence.

A. No. I don't say the outcrop is clearly in evidence; but the evidence of the outcrop—the apex is defined by the discoloration of the phosphate rock giving it a brown color.

Q. Are there not hundreds of feet in places where the series is so covered with wash that the outcrop is not clearly traceable?

A. There are, with the exception that they have been cut [862] through by development cuts that have exposed it.

(Testimony of Robert N. Bell.)

Q. In all of these places? A. Yes, sir.

Q. And cut out to the highest rim of the series?

A. Yes, sir.

Q. At the point near post 1 of the Arkansas lode there is indicated a gully or depression?

A. Yes, sir.

Q. The black line runs right across to the north—north and south—across this gulch. Does that gulch cut the phosphate bed? A. Yes, sir.

Q. But the outcrop shows entirely across that gulch?

A. No; it is covered with the bottom of the gulch.

Q. So that where this line—the dark line—crosses the little gulch, it is not in evidence?

A. I don't believe it is at that particular point for a few feet. The gulch is very narrow there.

At this time a recess or adjournment was taken until to-morrow morning at 9:30 o'clock. [863]

On Saturday, the 24th day of June, 1911, at 9:30 o'clock A. M., the hearing was resumed, pursuant to adjournment.

ROBERT N. BELL, a witness heretofore called by the defendant, and duly sworn, being recalled for further cross-examination, testified as follows, to wit:

Cross-examination (Continued).

(By Mr. JACK.)

Q. Mr. Bell, I was asking you as to the direction in which the vein dips. You said it dipped west, and I asked you if the plane dipped into the mountain. What was your answer in regard to that?

A. My answer was that it dipped out of the moun-

(Testimony of Robert N. Bell.)

tain, towards the valley.

Q. How far would it extend on its dip before it run clear out of the surface that was dipping into the mountain?

A. Well, you rather misunderstand my meaning. I don't believe that it would ever come to the surface, but it would still dip out from the axis of the mountain towards the valley, but probably pass under the valley at a relative distance from the surface that it has from the slope of the anticline which the mountain is formed of. [864]

Q. That is, it more or less conforms to the slope of the mountain?

A. In its southern half, yes; although there is one point on the Overton lode, I think,—yes, on the Overton lode,—where the bed is exposed at its lowest point where the dip seems to flatten, as if the whole series was flattening, and would consequently be brought a good deal nearer the surface when it reached under the valley than it is to the surface of the anticline, as exhibited by the slope of the mountain.

Q. But you think it is sufficiently deep to carry it down under the valley? A. I believe it, yes.

Q. I show you a picture purporting to be taken on the Obey lode. See if you recognize the hill.

A. Yes, sir.

Q. That is a view looking south, at tunnel No. 4 of Exhibit 1, and at the stripping done on the outcrop of the vein. Do you recognize that?

A. Yes, sir.

Q. And the one below it, taken from dump at tun-

(Testimony of Robert N. Bell.)

nel No. 1? A. Yes, sir.

Q. That is a fair representation of the mountain there, and the strike of the vein?

A. Yes, of the part that was covered by that.

Q. Yes—forming the west side of Gertch Hollow, which is a subsidiary gulch tributary to Montpelier Creek, and Montpelier Creek seems to cut the axis of the mountain almost at right angles. (Submitting said photograph to the witness, who examined the same.) [865]

Mr. JACK.—We offer that in evidence, for the purposes of illustration.

Mr. BUDGE.—We object to the introduction of this exhibit, upon the ground that it contains explanations, or purported explanations, upon which there is no testimony; and the foundation has not been properly identified.

Mr. JACK.—I will furnish you copies for the other case.

Said photographs were thereupon marked for identification as Plaintiffs' Exhibit 2 and Plaintiffs' Exhibit 3, respectively.

Mr. JACK.—I will say that the explanations upon the exhibits are taken from the testimony of the witnesses in this case.

Q. Do you still adhere to your definition of a vein, and that the characteristics of the vein must be such as you stated?

A. Yes. The essential characteristics of a vein must show an altered condition of the rock, and a

(Testimony of Robert N. Bell.)

metallic-ore-bearing gangue—or the wall rock, I should say.

Q. You are familiar with lead deposits in limestone? A. Yes, sir.

Q. Is the theory of the origin of such lead deposits that the mineral is carried up in solution through crevices or along the plane jointures of the several strata, and leaching out or cutting out the lime, and depositing the valuable contents of the waters in lieu of a lime carbonate?

A. Yes, sir; that would in a measure conform to my idea, [866] that the solutions which formed the lead ore came up through deep-seated fractures in the earth's crust, usually in the form of hot mineral solutions, containing acids, in combination generally, to form the sulphide, and that that acid solution invariably has an alterating effect on the enclosing formations that the mineral finally rests in.

Q. And replaces the substance of the rock in which the metal is finally deposited?

A. It very frequently does so; yes.

Q. And is it a fact that it is more frequently found in limestone because the limestone yields more readily to such solution and replacement?

A. The best lead mines in the world are not found in limestone.

Q. Well, where they are found in limestone, is it not on account of the lime yielding more readily than the surrounding rock?

A. I think that is true, yes—a solution and metasomatosis.

(Testimony of Robert N. Bell.)

Q. This process of replacement is known as metasomatic action? A. Yes, in a measure.

Q. In such deposits, isn't the metal found then corresponding with the formation of the original lime strata?

A. Conformably with the original lime strata?

Q. Yes.

A. There are numerous exceptions, where the metallic ore minerals conform with the original strata of the— [867]

Q. What is that?

A. I say there are numerous exceptions, where the metallic ores are found conforming with the bedding of sedimentary strata; but almost invariably connected with those conditions is the trunk fissure or feeding vein or channel through which those solutions rose from the interior bowels of the earth to their localized position.

Q. But the mass of the metal would be found as conforming to the strike of the original beds, and conforming in appearance to the original bed?

A. Physically conforming, but invariably to my mind would show the alterating effects of its nature on the enclosing walls or beds.

Q. In such a deposit as that, does the body of ore terminate abruptly; or does it extend out into the lime-bed in the form that is known as "feathering"?

A. Frequently in your country it "feathers" out in the bed; but invariably shows spur-joints in the joints of the beds, and shrinkage planes would be more or less mineralized.

(Testimony of Robert N. Bell.)

Mr. BUDGE.—You mean by "in your country"—do you mean in Utah?

WITNESS.—In Utah; yes, sir.

Mr. JACK.—Q. And isn't that true generally, where lead deposits are found in limestone?

A. I think that is the general rule.

Q. In that case, is the cleavage between the ore deposit and the wall rock clear and distinct, with the altered appearance, [868] and having a selvage?

A. There are conditions in formations, I presume, including limestone, where the division is not clear; where it may gradually blend from ore into country rock, and shade out insensibly until they are both pure, graduating from pure ore to pure country rock, without any distinct line of demarcation.

Q. Then, you still adhere to your statement that one of the essentials of a vein is that the walls shall be clear and distinct, with a selvage, and showing an altered appearance at the point of contact with the ore body?

A. That would be an altered appearance.

Q. But not an alteration in the rock itself?

A. It would be an alteration in the rock itself. You could readily distinguish what had been limestone from its usual structural appearance left. For instance, illustrating: In Park City there are places adjacent to the fissures, even to the bedded deposits to lead ore that you describe, where the limestone, after the lead has been deposited there, still on one side of the ore body being a channel for the circulation of silicious water, which has changed the pure

(Testimony of Robert N. Bell.)

limestone into what is now almost pure quartzite, replaced the lime particles with silica particles, but still retained the structural markings and characteristics of the limestone, so that you can see that it unquestionably was a limestone before it was silicified.

Q. Silica particles are carried up in hot solutions when they are deposited, is the usual theory, is it—is the accepted theory?

A. The solutions might vary in temperature—silicious solutions. [869]

Q. And the alteration in the wall rock in the case you are discussing is marked and noted?

A. Very decidedly. You can follow along the wall in places and find where the silicious solutions, for some reason—the tightening of the joints or channel of circulation—has prevented their action, and the pure lime comes in actual contact with the ore.

Q. Always in this feathered edge in the lime wall, we will find the point of contact with the ore, or a few inches back or a foot, is altered in appearance, and becomes more silicious?

A. There is invariably a condition of change in some form. It may be a simple silicious facing on the general country rock that may not be over a quarter of an inch thick. But it will show some condition of alteration where acid solutions of metallic ores have been in contact with it, or in the gangue's contact, sometimes an actual welding of one formation into the other.

Q. The accepted theory as to these ore deposits, as you have stated, is that the mineral is carried up in

(Testimony of Robert N. Bell.)

hot vapors, or hot waters, from the interior of the earth?

A. Yes, that is the general one—accepted.

Q. Isn't it true that the veins become enriched by the leaching out of upper rocks, and the mineral contents from the surrounding rocks are redeposited in the vein, thus enriching the metallic substance of the vein, in a great many cases?

A. That is a very common occurrence and experience.

Q. In regard to this deposit in question, wouldn't that theory as to the origin of the phosphoric acid in this rock be equally applicable? **[870]**

A. No.

Q. You think it would be unreasonable to assume that the phosphoric acid was carried up in solution in hot waters or hot vapors, and deposited in the limestone, the same as lead or other substances?

A. I think it would be decidedly unreasonable to suppose that the phosphoric acid in the free state you have came up in that form. It is unlikely that it would have remained in its apparent sedimentary form, if it had originated as you state. Your proposition would involve the origin of the phosphoric acid to have occurred in a manner such as the apatite veins occur.

Q. Is it your theory that the apatite veins occur in that manner?

A. I am candid in my belief that they do.

Q. What is the difference between the contents of this deposit and apatite?

(Testimony of Robert N. Bell.)

A. The difference is that the apatite calcium phosphates are invariably crystalline, and show the evidence of solphataric action.

Q. In this case, you say?

A. No—in the case of apatite veins.

Q. And is that true in regard to this deposit?

A. No—absolutely the opposite. There is no evidence of solphataric action in connection with these deposits.

Q. What works have you read in regard to this kind of a deposit?

A. Why, I have read all the recently published reports of the United States Geological Survey.

Q. Who prepared those reports that you have read? [871]

A. Why, principally Mr. Weeks, and Ferrier, and Richards, and Blackwelder, and Gale, and Gerty; and I have read other reports that I can't now recall the title of, and I have been a constant reader of the trade journals in the business for 25 years, in the course of being familiar in a general way with the nature and origin of the southeastern phosphate deposits, and apatite deposits, etc.

Q. You think it is unreasonable to assume that the phosphoric acid came up in solution, the same as the valuable minerals in other deposits—in metallic deposits? A. In this case?

Q. In the case of phosphate deposits, in this case, or in similar formations? A. In this case—

Q. In this case do you refer to this particular deposit, or to this western deposit of phosphates in

(Testimony of Robert N. Bell.)

Western States?

A. The Western oolitic phosphates I consider—I consider it is unreasonable to suppose that they could have ascended as hot solutions, such as other ore sources are formed from.

Q. The phosphoric acid is in the interior of the earth, the same as other substances composing valuable mineral deposits, is it not?

A. It is very generally disseminated.

Q. So there is nothing unreasonable in the supposition that they are carried up by the subterranean waters and vapors in that respect, is there?

A. Well, the only unreasonable feature is that there is not any fissuring, or evidence of a direct connection with the interior of the earth, in this case. It was laid down on the surface of [872] the earth.

Q. Isn't there fissuring along the bedding-planes between the several strata composing the crust of the earth where this deposit is found?

A. No; I didn't notice any fissuring at all. There is very little movement. The only evidence of movement is where the pits have been locally disturbed in the process of the formation or folding of the anticlines.

Q. Isn't there a fracture along the planes of the several strata?

A. No fractures, no sir. The beds are conformable; they don't fracture. They follow the surface, in other words.

Q. Isn't there always a point of least resistance between the different strata?

(Testimony of Robert N. Bell.)

A. There is a point—there is a line of least resistance, unquestionably, due to the difference in the texture of the different beds; but in spite of that fact, and in spite of the unquestionable folding and disturbance of the strata, there is a very little slipping or movement of one bed on the other, in this case.

Q. What is your theory as to the origin of the phosphoric acid found in this immense deposit?

A. My theory is that it is a surface precipitation in the shallow ocean water of a marine plateau. The origin may have been, as it is evident from the overlying cap lime, of enormous development of organic life; and as we know that organic animal life is very rich in phosphoric acid, some condition may have arrived at that period or age that destroyed or killed that animal life, and that the bodies of that animal life, which is shown [873] in such innumerable myriads, as exhibited by the fossils of the cap lime, I can readily conceive could be rotted, and give up their soluble phosphoric acid into the solution of the body of water in which they occurred; and that the action of some other form of bacteria or microscopic organisms still existed that had the ability to precipitate that phosphate.

Q. Secrete—

A. Secrete—I thank you for the word.

Q. Secrete phosphoric acid?

A. Secrete that phosphoric acid from its solution in the ocean water, together with lime carbonate, and form these little pebbles, oolites, or nodules of lime phosphate, as we now find them. Another probable

source of the phosphoric acid would be the evidence of this marine animal life in the form of shell-fish, would probably warrant the belief of the existence of bird life in enormous myriads has existed, by the exhibition of bird guano or manure on the South American coast, in beds 100 feet thick or more, or very soluble phosphoric acid, and such beds of guano may have existed on the land border of these shallow oceans and have been leached by rains and carried by streams into the waters of the ocean in question, and there precipitated as before, by secretion.

Q. Then, as I understand you, the bottom of this ocean where the deposit was made, consisted of a lime formation? The lime was there?

A. The lime floor was the basal lime, yes.

Q. And that is what we find in connection with this deposit? A. Yes, sir. [874]

Q. And the sulphuric acid—

Q. Phosphoric—

Q. —the phosphoric acid was precipitated from the water and united with the lime at the bottom, forming this phosphate?

A. No, I don't think that. I think the lime was also in solution with the phosphoric acid, and the two precipitated together, in unison.

Q. But they united before they precipitated?

A. They united coincidentally with their precipitation.

Q. Yes—they were both deposited together?

A. Yes, sir.

Q. And united in this bed? A. Yes.

Q. You spoke about the phosphoric acid being

(Testimony of Robert N. Bell.)

leached out and precipitated into the water. Isn't it true that that leaching or precipitation from the upper layers as they now exist, or after the first bed was formed, probably took place and leached down, so that the upper strata would be less valuable for the phosphoric acid than the lower strata? In other words, enriching the lower strata?

A. No, for the reason that after phosphoric acid—my understanding of it is—is fixed in the form we now find it, that it is very slightly soluble; while in its original guano form it is very soluble; and if the upper beds had been leached after they were fixed and formed into rock, the effect of that leaching would be evident in the passage of that acid from one bed to the other, by altering the strata in between.

Q. Isn't it true that the weathered portions of this deposit have been leached more or less, and contain less phosphoric [875] acid than the rock below it?

A. I don't admit that that is true. My understanding from the practical men in authority and experience who are handling this material, and know the actual results of such matters, is that there is hardly any difference—

Q. You say "hardly any difference." Is there any difference?

A. There may be a slight difference. Any mineral is liable to a surface alteration, but some of them to very slight alterations.

Q. Did you ever make an analysis, or have any

(Testimony of Robert N. Bell.)

made for the purpose of ascertaining that fact?

A. No. I have taken it for granted, on account of the great volume of evidence introduced in this case covering that point, that those facts were correct—substantially so.

Q. You don't know, outside of what you have heard in this case?

A. Well, in this case, and the results of the analyses of the United States Geological Survey, which were made for the purpose of determining the facts without any bias.

Q. Well, I say, that is the source of your information? A. Yes, sir.

Q. You say you got your information from men actually working with these deposits?

A. Yes, sir.

Q. You mean the employees of the San Francisco Chemical Company? A. Yes, sir.

Q. Is it not a plausible theory that the position now [876] occupied by these phosphate beds was formerly a bed of oolitic limestone, and that the ascending and descending waters containing phosphoric acid in solution might by the same metasomatic process that we have in the other deposits have replaced the oolitic limestone, and left the original bed in its present condition as phosphate ore?

A. No; it seems physically impossible to my view of its origin, for the reason that there is not any evidence of any other substance that has been replaced. The oolites, if they had been replaced as you suggest, would not have been uniformly replaced. As I

(Testimony of Robert N. Bell.)

have stated in the case of the Park City metamorphosed limestone into quartzite, there is a graduation and a difference in different parts of the vein or wall rock in question, and there could not be such a uniform metasomatosis—

Q. This phosphate deposit, as it occurs now, is not in the same form, or is not the same rock as the original limestone—oolitic limestone bed—is it?

A. I think it is, absolutely, without any question.

Q. That is the original limestone bed?

A. I think it is. I think it was formed as a—

Q. Then how does it differ from the rock above and below? Isn't that oolitic limestone below it?

A. No.

Q. Is it oolitic limestone above it? A. No.

Q. Is it limestone at all? A. It is.

Q. But not oolitic?

A. Not oolitic, in the sense that this bed is oolitic.

[877]

Q. The intervening layers in this strata, are they oolitic limestone? A. Some of them are.

Q. Some of them are? A. Yes, sir.

Q. And now is that intervening layer that you say is oolitic limestone the same as the phosphate bed?

A. Those narrow layers of oolitic phosphate rock are conditions and beds that were formed under similar conditions to the lower beds, at a subsequent time.

Q. And what do you mean by saying that the phosphate bed is the original oolitic limestone bed? Do you mean that it is the same as the layer above it?

(Testimony of Robert N. Bell.)

A. Well, it is the first one that was laid down in that series. It was made and finished and completed and partly consolidated, and then a changed condition occurred in the marine life and a different form of rock was deposited.

Q. Yes, and then—?

A. Then, the original condition was repeated, and another layer, not so thick, was formed, under similar conditions as the lower bed—just simply a repetition of the—

Q. The phosphate bed—referring to the lower bed—is an oolitic limestone bed, is it?

A. It is an oolitic bed of lime phosphate—not an original oolitic limestone.

Q. Then, it has been replaced by something, or changed by something from its original state as an oolitic limestone bed, has it not?

A. I say it is not an oolitic limestone bed. It is an [878] oolitic phosphate bed—calcium phosphate.

Q. That is the question I asked you: Is it not reasonable to suppose that the original oolitic limestone bed has been changed, and the phosphoric acid has been substituted for some element in the oolitic limestone bed, thus converting it into a phosphate bed?

A. I beg your pardon. I misunderstood your question.

Q. I thought you misunderstod me.

A. I did. I wish to correct my answer, if I have conveyed that idea.

Q. Yes.

(Testimony of Robert N. Bell.)

A. My idea is that it is not an original oolitic limestone bed; it is an original oolitic calcium phosphate bed.

Q. I just asked you if the theory was not reasonable, that it might have been an original oolitic limestone bed and have been changed by metasomatic action, by which the phosphoric acid penetrated the original bed and substituted this phosphoric acid for some other ingredient, thus converting it into lime phosphate instead of lime carbonate? Isn't that a reasonable theory and explanation for it?

A. No, I think that is a decidedly unreasonable theory.

Q. Why is it more unreasonable than the case of the lead deposits in the limestone?

A. As I have previously explained, the absolute uniformity of texture of these amorphous pebbles, from one end of the property to the other, for nearly three miles, and as I am informed for hundreds of miles, has never been known to occur in any metallic matasomatosis, in such regularity.

Q. The origin of these phosphate deposits and the origin [879] of the phosphate is purely a matter of theory, is it not? A. I don't think so.

Q. Is it a case of knowledge?

A. I think there are cases of absolute knowledge.

Q. Well, is this a case of absolute knowledge?

A. Well, there is nobody living that saw it done, that's a fact; but the conditions are such—

Q. No—that is a fact—

Mr. BUDGE.—Well, let him explain that.

(Testimony of Robert N. Bell.)

Q. You are entitled to your theory, as well as anyone else.

A. Investigations for the purpose of demonstrating these facts have been carried out at enormous expense, to this and other governments of the world, for a number of years, and it is the common sense conclusion of the most scientific minds of the world that it did occur under those conditions.

Q. Yes; but then at best it is only a theory is it not?

A. Well, it is more than a theory. If I can see a shell on the surface of the earth, with a snail in it, of a definite form, and I can go on to the sea shore and I can see another shell, with an animal body in it like a mussel or a clam, alive, and see it move and breathe, I know that it exists. If I go into the solid rock and see the fossil remains of a shell in just as perfect detail as the one that is alive to-day, I am positive in my own mind that it existed; that it lived and had a body and breathed and existed under the conditions of the one that I see before my eyes.

Q. And in that sense it is—

A. In that sense it is a fact, and not a theory. [880]

Q. You say you don't think it is reasonable to assume that the leaching process has accounted for the richness in certain portions of this deposit?

Mr. BUDGE.—Mr. Jack, I don't want to interpose any objection, but we have been over—that is, you have been over that leaching process at least ten times, or twelve, and it strikes me that it is encum-

(Testimony of Robert N. Bell.)

bering the record to go over it again. It has been gone over and over and over and over.

A. My understanding is, as I have previously stated, that the phosphoric acid is a decidedly fixed acid, and not subject to leaching by ordinary surface placer influences. It could only be under conditions of internal solphataric heat that it could be made soluble and leached and re-precipitated.

Q. Well, you can make that short. I will ask you if you didn't acknowledge that as a reasonable theory?

A. That these beds had been leached and enriched?

Q. Yes.

A. I will admit that, to a very slight degree.

Q. How do you account for the lower bed being so much richer than the upper strata?

A. Why, I don't account—I don't acknowledge that it is. I think it is just as rich in the upper strata as it is in the lower strata—simply a difference in quantity.

Q. What kind of locations do you as a miner recognize—just the two classes?

A. Oh, there are various kinds of locations, covering different kinds of mineral. [881]

Q. Are they not either lode or placer?

A. Or coal.

Q. Is that a mining location?

A. Yes, sir; a coal location is a mining location. It is made for the purpose of mining coal.

Q. Outside of coal do you recognize more than the two—placer and lode locations?

(Testimony of Robert N. Bell.)

A. In connection with mineral deposits, do you mean?

Q. I mean with a mineral ground.

A. No, I don't just think of any other that I could use; and if I couldn't use anything but a lode claim on a mineral deposit, I surely would use it.

Q. You are a practical miner? A. Yes, sir.

Q. Of many years' experience? A. Yes, sir.

Q. You have located many claims, both placer and lode? A. Yes, sir.

Q. You attempt to locate them under the provisions of the law, do you not? A. Yes, sir.

Q. Section 2320 of the United States statutes provides for the location of what are known as lodes or veins? A. Yes, sir.

Q. Now, that provides for locations upon veins of quartz containing gold or other valuable deposits, does it not? A. Yes, sir.

Q. It also provides for locating other rock in place, containing gold or other valuable deposits, does it not? [882]

A. Yes; but it necessitates a vein or lode before you can locate the other rock in place; you must have a vein or lode.

Q. The statute does not say so, does it Mr. Bell?

A. It does; the succeeding section says that before you can make a valid location you must discover a vein or lode.

Q. Does it not say you must discover rock in place?

A. A vein or lode must be discovered before a

(Testimony of Robert N. Bell.)

valid location can be made on any kind of a lode.

Q. That is your idea of the law? A. Yes, sir.

Q. Then, if the statute provides that mining claims upon rock in place, containing gold, silver or other valuable deposits, must be located in a certain manner, it is contrary to your understanding of it, is it? A. I don't quite understand the question.

(Said question was repeated, as follows:)

"Q. Then, if the statute provides that mining claims upon rock in place, containing gold, silver or other valuable deposits, must be located in a certain manner, it is contrary to your understanding of it, is it?"

A. My understanding of the statute is—

Q. Just answer if that is contrary to your understanding.

Mr. BUDGE.—Just read that question again, Mr. Hamer. I don't understand it.

(Said question was again repeated, as follows:)

"Q. Then, if the statute provides that mining claims upon rock in place, containing gold, silver or other valuable deposits, must be located in a [883] certain manner, it is contrary to your understanding of it, is it?"

Mr. BUDGE.—That is incompetent, and I object to it as calling for a conclusion of law, and assuming something that is not in evidence.

Mr. JACK.—Q. You may answer if that is contrary to your understanding, if that is the provision of the statute?

A. My understanding of the provision of the stat-

(Testimony of Robert N. Bell.)

ute is, that you must first have a vein or lode to locate rock in place or a placer deposit.

Q. And is this other construction contrary to your understanding?

A. I don't understand that the statute permits the location of rock in place as a lode, without discovering a vein or lode first.

Q. For placer locations the provision is that all other forms of deposit—valuable deposits of mineral except rock in place, can be located as placer, is it not?

A. The provision of the placer law is that certain substances contained in rock in place can be located as placer, as well as loose substances.

Q. Under the general mining law?

A. Under the general mining law, the way I understand it. And there are numerous illustrations of it having been legally done.

Q. And those substances not specifically mentioned in the statute that may be located as placers, must be located according to whether they are in rock in place or not? Isn't that true? [884]

A. Well, they must be located, but their character would govern the manner in which they must be located.

Q. The character of the—

A. —of the substance.

Q. —of the substance?

A. Of the substance, yes, and the condition under which it occurred.

Q. Do you agree with this definition of a vein or

(Testimony of Robert N. Bell.)

lode: "By veins or lodes, as used in the statute, are meant lines or accretions of metal embedded in quartz or other rock in place." Do you agree with that definition of a vein?

A. That would cover some forms of lodes or veins —that definition.

Q. But not all?

A. Not all forms, particularly—

Q. It would have to be a metallic substance, would it?

A. Not necessarily. I can conceive of—

Q. What forms would it not cover?

A. Why, the lodes or veins have such a wide diversity of forms that I don't know. There are some that it would not specifically cover, I think.

Q. Would any form of deposit that answered that definition be a lode or vein?

Mr. BUDGE.—Just read that definition again, will you, Mr. Hamer, please?

(Said question was repeated, as follows:)

"Q. Do you agree with this definition of a vein or lode: 'By veins or lodes, as used in the statute, are meant lines or accretions of [885] metal embedded in quartz or other rock in place.' Do you agree with that definition of a vein?"

A. No. That would be an indefinite definition, because that would include beds of mineral matter, unaltered, that were not lodes.

Mr. JACK.—Q. That would not include all forms of deposit?

(Testimony of Robert N. Bell.)

A. All forms of lode or vein deposits?

Q. Yes.

A. No. That would come under the requirement —under the lode mining law.

Q. Do you agree with this definition: "All forms of mineral or mineral gangue in place, whether fissure or contact veins, or impregnations or other irregular deposits, should be construed to come within the expression 'veins or lodes,' used in the Act of Congress, and as such be subject to location and patent under the Act." Do you agree with that?

WITNESS.—I will ask you to read that again, Mr. Hamer.

(Said question was repeated, as follows:)

> "Q. Do you agree with this definition: 'All forms of mineral or mineral gangue in place, whether fissure or contact veins, or impregnations or other irregular deposits, should be construed to come within the expression "Veins or lodes," used in the Act of Congress, and as such be subject to location and patent under the Act.' Do you agree with that?" [886]

A. No, sir; there is an exception to the proposition you put.

Q. What is the exception?

A. That mineral bodies bedded would not be locateable as a lode or vein in every instance. There are numerous instances and conditions, with proper connections, under which those bedded mineral deposits might come under the lode mining law; but those conditions—attendant conditions—must exist,

(Testimony of Robert N. Bell.)

to make a bedded mineral deposit eligible for that statute.

Q. You have no interest in any phosphate deposits yourself, have you? A. Absolutely none.

Q. When did you first investigate these phosphate deposits?

A. I saw this phosphate rock first in 1903, and since then my next investigation of it was after reading about it for several years of the experience of others, on the 24th of May of this year—wasn't it?

Mr. BUDGE.—I think it was the 20th.

Mr. JACK.—Q. Well, this year, was it, some time? A. This year, yes.

Mr. JACK.—That's all.

Redirect Examination.

(By Mr. BUDGE.)

Q. Now, Mr. Bell, you have been interrogated as to lead or galena deposits along the bed stratification. I call your [887] attention to the illustration shown on page 100 of the Syllabus of Economic Geology, by Bryner & Newsome, the second illustration appearing on page 100, and ask you if that is your idea—if that presents your idea of the manner in which the stratification is affected by a galena deposit, along the bed?

A. Yes; that illustrates the divergence of the ore solutions from a regular channel.

Q. In other words, I understand you that while galena deposits sometimes conform to a bed—to the bed in which they are found—to some extent, that

(Testimony of Robert N. Bell.)

they break through, at various places, the stratification which adjoins the particular bed in which a portion of the deposit may be found?

A. Yes, sir; and that condition is so well recognized that it is mentioned in the mining statute, and covered by dips, spurs and angles, which are known to be so common to all lode and vein deposits.

Q. And where the galena deposit runs along the bed, is it not also true that there will remain within that galena deposit which lines along the bed, a portion of the rock or sedimentary deposition which was there before the galena came into the bed?

A. Yes, sir; it is almost invariably the rule that there is a blending of the formation that has been replaced with the ore that has replaced it, if not absolutely digested or absorbed.

Q. Where the galena comes into a bed, the joint planes or cleavages of the rock adjoining the bed in which the galena may appear—that is, on either side of the galena deposit along the bed,—would be mineralized to some extent? A. Almost invariably. [888]

Q. Calling your attention to Defendant's Exhibit 4, and to the limestone marked two feet in thickness, which immediately overlies the five-foot five-inch main phosphate bed. I will ask you whether, if a phosphate deposit had been injected in solution, the joint-planes shown in that cap limestone above the five-foot bed would not have been mineralized?

A. It would be impossible for the injection of solutions up that bed (which would have to be under

(Testimony of Robert N. Bell.)

heavy pressure to be injected against such a structure) to have failed to have leaked into those joint-planes, if they were open at that time, and they probably were.

Q. And there is no evidence whatever—

A. From my inspection of the particular bed in question, I didn't see any evidence of any leaching or precipitation of the phosphatic material in those joint-planes.

Q. And from your investigation of the series of beds, did you notice any indication or evidence of the precipitation or conveyance of any substance from one bed to another?

A. No. I don't believe there has been any. In fact, the layers between the principal beds and the lower beds above the cap lime are of a shaly nature, and impervious, practically—I won't say impervious, but decidedly less pervious than the limestone, and the solutions would travel along rather than through those shaly beds, and I don't believe that there has been any transmission of phosphoric acid from one bed to the other.

Q. Well, is there any evidence of this stratification being broken in any part of this bed that you examined; and by that I mean any fracture of the stratification?

A. There are some small fractures by recent disturbances, but [889] no discontinuity of the beds; they are uniform, one above the other, and they are not replaced one with the other. They thicken and thin; but apparently each member is represented—

(Testimony of Robert N. Bell.)

or each section I saw of the deposit for several miles along its length.

Q. And each bed distinct from the other?

A. Yes.

Q. Calling your attention to this exhibit which has been introduced by the plaintiffs, called Plaintiff's Exhibit 3. Now, I will ask you, Mr. Bell, whether as a matter of fact the line drawn on that photograph is the strike of the bed or the outcrop?

A. It is not the strike of the bed, it is the outcrop of the bed, and the line, after a closer inspection of it, seems to have been wilfully deflected from the line of the outcrop in this lower picture.

Q. You say it is not the strike of the bed?

Mr. JACK.—That it is not intended to be accurate—just to indicate—

A. There is a divergence there of 45°. Here is the line of the outcrop, and there is the line of the strike. (Indicating upon said photograph.)

Mr. JACK.—Well, "outcrop" is probably as good a word as "strike."

Mr. BUDGE.—Q. Well, in this photograph, at the particular point supposed to be represented by the photograph, the outcrop as it appears in this photograph would not be the strike of the bed? [890]

A. Not necessarily, no.

Q. Well, do you know as a matter of fact whether it is the strike?

A. I think it is not the true strike.

Q. Now, when you say, Mr. Bell, that in your judgment the formation of this bed of calcium phosphate

(Testimony of Robert N. Bell.)

was brought about by these various forms of animal life, and by the washing in by the wave action of the deposits of guano or other phosphatic materials, and that this phosphoric acid was precipitated, and thus formed this bed, and that it was precipitated with calcium; did you wish to convey the idea that the calcium mentioned which was precipitated with the phosphoric acid was the bed of calcium carbonate underneath? A. No.

Q. Is it your idea that this bed of calcium carbonate existed before any of this bed?— A. Yes, sir.

Q. —of phosphate rock was laid down?

A. That is my impression.

Q. And the calcium which was precipitated with the phosphoric acid was simply the calcium which was in the water? A. Yes, sir, absolutely.

Q. Now, what is the proportion, Mr. Bell, of veins or lodes in igneous and in sedimentary rocks?

A. Why, I think that volcanic phenomena is the primal cause of the origin of lode and vein deposits, and that fully 90% of all the valuable metallic ore deposits in the world are associated either in or in contact with or in close association with igneous rock, which accounts in a large measure for [891] their origin from deep-seated sources. These igneous rocks are known to penetrate the interior bowels of the earth, and afford channels for the ascension of the mineral solutions and the heavier metallic minerals.

Q. What have you to say as to whether this is an igneous rock formation here in this deposit?

(Testimony of Robert N. Bell.)

A. I think it is decidedly the opposite of an igneous formation. It is a cold water laid formation, on the surface of the earth, and I did not see any evidence of igneous intrusion anywhere in the vicinity of these deposits.

Q. Now, have you any other reasons than what you gave on yesterday why this is not a vein or lode, in your opinion?

A. Why, I might say that my reasons are that it is of such uniformly regular bedded appearance, of unquestioned sedimentary origin, that has remained practically unaltered since it was formed, and that on the other hand a lode or vein is a very irregular deposit, or such deposits vary in form so widely that there is a decided contrast in the bed; together with the fact of the irregularity and uncertainty of the action of a vein below the surface, the statute provides an extralateral right, which generally also conveys a lawsuit to the claimant of the ground.

Mr. JACK.—Conveys a what?

A. A lawsuit. The difference between this deposit and a lode deposit, as an average of lode deposits, is one of uniformity; in this instance of a surface sedimentary mineral, as contrasted to an irregular, indefinite form of a mineral deposit, as may be covered by the lode or vein mining law.

Mr. BUDGE.—Q. What have you to say as to how the stratification is [892] respected by veins or lodes?

A. It is usual and very common to find vein or lode deposits cutting the enclosing formations, in both

(Testimony of Robert N. Bell.)

strike and dip, and rather unusual to find them conforming to the bedding enclosing formations as the deposits do. In other words, the lode or vein deposits are absolutely strangers to their environments; and this is a conformable, consistent sedimentary deposit that belongs in the position in which it originated.

Q. Well, where they do conform—where veins or lodes do conform to the bedded stratification, it has been by a process of replacement?

A. By a process of replacement, and the channel of the solutions which did the replacing is usually at a different angle from the bed, and almost always in evidence.

Q. And it mineralized the joint-planes adjoining?

A. Yes, sir.

Q. The joint-planes of the country rock?

A. Yes, sir.

Mr. BUDGE.—I think that's all.

Judge DEY.—That's all.

Mr. BUDGE.—I want to have it understood, if it is agreeable to you, that Mr. Glenn's testimony go in as part of the Wyoming case, if you haven't any objection.

Judge DEY.—Glenn was about what—taking up coal?

Mr. BUDGE.—Yes.

Judge DEY.—Oh, well, I don't care.

Mr. BUDGE.—Now, Mr. Hamer, will you take [893] down what I am about to say? In the Idaho case solely, at the taking of depositions, counsel for

the defendant put in evidence certain correspondence and telegrams between Messrs. Goodfellow and Eells, and Messrs. Dey & Hoppaugh. Counsel for the plaintiff asked for the production of the letter of April 15th, 1910, written by Dey & Hoppaugh to Goodfellow and Eells, which has now been produced, and which we now offer, and ask to have marked as an exhibit.

(Said letter was thereupon marked Plaintiffs' Exhibit 4, and the same is in the words and figures following, to wit:)

**[Plaintiffs' Exhibit No. 4.]**

Salt Lake City, Utah, April 15, 1910.

Messrs. Goodfellow & Eells,
Counsellors at Law,
430 California Street,
San Francisco, Calif.

Gentlemen:

Referring to the annual assessment work required to be done by Messrs. Duffield and Jeffs on certain lode mining claims claimed by them and situate in Bear Lake County, Idaho, over which we had an understanding in reference to assessment work for the year 1908 following bill of complaint filed by Duffield and Jeffs in the U. S. Circuit Court of Idaho: [894]

The understanding we refer to is embodied in a letter from us to you under date of November 19, 1908; your telegram of November 23, our reply November 24th and confirmatory letter of the same date. Since that time we have not heard of the mat-

ter until today. Now we are informed that Messrs. Duffield and Jeffs were permitted to do the assessment work, not only for 1908 but for 1909, and now we desire to do the work for the current year. Assuming that they could do the work for this year, the same as they did last year, they prepared to do the work and have been notified by the San Francisco Chemical Company's agent that they are trespassing.

We submit the matter to you with the hope that an amicable arrangement can be reached whereby the work for this year may proceed peaceably upon the express stipulation, however, as heretofore: i. e., that the work that has been done and will be done shall be without disturbing the possession of the Chemical Company or prejudicial to any rights they may be able to establish.

Yours truly,

DEY & HOPPAUGH.

CCD HDC.

(The above letter was written upon the letter-head of "Dey and Hoppaugh, Counsellors at Law, Auerbach Block, Salt Lake City, Utah.") [895]

Judge DEY.—Mr. Budge, have you the original letter from C. B. Jack to Mr. Joseph J. Taylor, dated April 21, 1910?

Mr. BUDGE.—I don't think I have, Judge.

Judge DEY.—I submit to you a copy. (Handing same to Mr. Budge.)

Mr. BUDGE.—If you say this is a copy, it is all right.

Judge DEY.—Mr. Jack says it is a copy.

Mr. BUDGE.—All right.

Judge DEY.—And we offer that likewise, to be read into the record.

(Said letter was marked Plaintiffs' Exhibit 5, and the same is in the words and figures following, to wit:)

**[Plaintiffs' Exhibit No. 5.]**

Salt Lake City, Utah, April 21, 1910.

Mr. Joseph J. Taylor,
Agent—San Francisco Chemical Co.,
Montpelier, Idaho.

Dear Sir:

We have your notice to Morse S. Duffield in reference to work upon phosphate claims near Montpelier. Previous work was done under an agreement between us and Mr. Goodfellow that it should be without prejudice to rights involved in dispute between us. We have written Mr. Goodfellow that present work is to be done under the same conditions as contained in said stipulation [896] and you will probably hear from him soon that it is all right to allow Mr. Hoff to proceed with the assessment work upon the Duffield and Jeffs claims.

Respectfully,

C. B. JACK.

Mr. BUDGE.—It is understood, Judge Dey, that the Examiner attach copies of these exhibits which we agreed might be duplicated, and attached to the Wyoming record?

Judge DEY.—Yes, sir.

Mr. BUDGE.—And the record in the Wyoming case, that the two—that as to both, the Wyoming

cases, they are to be one record?

Judge DEY.—One record, yes.

Mr. BUDGE.—And that the evidence be considered as applicable to both cases?

Judge DEY.—To both cases, or to the consolidation of the cases.

Mr. BUDGE.—Yes.

Judge DEY.—Either way, as the Court may desire.

Mr. BUDGE.—Yes, that's it. [897]

**Defendant's Exhibit No. 6.**

N. 4–201.

Register's Final Certificate of Entry.

Serial 07448.

Receipt No. 393355.

DEPARTMENT OF THE INTERIOR.

United States Land Office,

At Blackfoot, Idaho, May 23, 1911.

Mineral Entry No. .....

Survey Lot No. 2505.

Authorized by "N" May 18, 1911.

IT IS HEREBY CERTIFIED that in pursuance of the provisions of the Revised Statutes of the United States, Chapter VI, Title XXXII, and legislation supplemental thereto, UTAH FERTILIZER & CHEMICAL MANUFACTURING COMPANY, whose post-office address is Salt Lake City, Utah, on this day purchased that mining claim known as the "Hillside Group" placer mining claim, embracing the Hillside No. 1, Hillside No. 2, Highland No. 1 and Superior Extension placer claims (consolidated) in Sections 24, 25 & 36, in Township No. 10 South

of Range No. 44 East, Boise Meridian, and Secs. 19, 30 & 31 Tp. 10 S., R. 45 E. B. and Sec. 24, Tp. 11 S., R. 44 E. B. M. designated as Survey No. 2505 placer claim, as entered, embracing 540 acres, in the unorganized Mining District, in the County of Bear Lake and State of Idaho, as shown by [898] the plat and field notes of survey thereof, for which the said part.... first above named this day made payment to the Receiver in full, amounting to the sum of Thirteen Hundred and Fifty Dollars.

NOW, THEREFORE, Be it known that upon the presentation of this Certificate to the Commissioner of the General Land Office, together with the plat and field notes of survey of said claim and the proofs required by law, a patent shall issue thereupon to the said Utah Fertilizer & Chemical Manufacturing Company, if all be found regular.

(Signed) HENRY W. KIEFER,
Register.

I hereby certify, this 20th day of June, 1911, that the above is a true and correct copy of the original Final Certificate issued by this office, as far as our records show.

HENRY W. KIEFER,
Register. [899]

**Defendant's Exhibit No. 7.**

N. 4–201.

Register's Final Certificate of Entry.

Serial 07447.

Receipt 393354.

DEPARTMENT OF THE INTERIOR,
United States Land Office,
At Blackfoot, Idaho, May 5, 1911.

Mineral Entry No. .....
Survey Lot No. 2497.
Authorized by "N" April 26, 1911.

IT IS HEREBY CERTIFIED That in pursuance of the provisions of the Revised Statutes of the United States, Chapter VI, Title XXXII, and legislation supplemental thereto, UTAH FERTILIZER AND CHEMICAL MANUFACTURING COMPANY, whose post-office address is Salt Lake City, Utah, on this day purchased that Mining Claim known as the "Highland" Placer mining claim, situate in Section 1, in Township No. 11 South and Sec. 36, Tp. 10 South, R. 44 E., Boise Meridian, of Range No. 44 East, Boise Meridian, designated as Survey No. 2497 placer lode mining claim, as entered, embracing 158.771 acres, in the unorganized Mining District, in the County of Bear Lake and State of Idaho, as shown by the plat and field notes of survey thereof, for which the said part.... first above named this day made payment to the Receiver in full, amounting [900] to the sum of Three Hundred Ninety Seven & 50/100 dollars.

NOW, THEREFORE, Be it known that upon the presentation of this Certificate to the Commissioner of the General Land Office, together with the plat and field notes of survey of said claim and the proofs required by law, a patent shall issue thereupon to the said Utah Fertilizer & Chemical Manufacturing Company, if all be found regular.

(Signed) HENRY W. KIEFER,
Register.

I hereby certify, this 20th day of June, 1911, that the above is a true and correct copy of the original Final Certificate issued by this office as far as our records show.

HENRY W. KIEFER,
Register. [901]

**Defendant's Exhibit No. 8.**

41997.
N. 4–201.

Register's Final Certificate of Entry.

DEPARTMENT OF THE INTERIOR.
United States Land Office.

At Evanston, Wyoming. December 15, 1910.

Mineral Entry No. 02470.

Lot No. .....

IT IS HEREBY CERTIFIED That in pursuance of the provisions of the Revised Statutes of the United States, Chapter VI, Title XXXII, and legislation supplemental thereto, The San Francisco Chemical Co., a Corporation by Joseph J. Taylor, its Agent and Attorney in fact: Whose post-office

address is Montpelier, Idaho, on this day purchased that Mining Claim known as the Layland Placer Mining Claim, for the E. ¾ SW. ¾ of SE. ¼ of Sec. 18; the NE. ¼ NW. ¼ of NE. ¼ of Sec. 30; the E. ¾ SW. ¼ of SE. ¼, the E. ¾ NW. ¼ of SE. ¼, the E. ¾ SW. ¼ of NE. ¼, and the E. ¾ NW. ¼ of NE. ¼ of Section 19, in Township No. 27, North of Range No. 119 W. 6th P. Meridian, designated as Lot ..... No. ..... Said Lot No. ..... extending ..... feet in length along said ..... vein or lode, expressly excepting and excluding from said purchase [902] all that portion of the ground embraced in Mining Claim ..... or survey designated as Lot ..... No. ..... and also all that portion of any vein or lode the top or apex of which lies inside of said excluded ground; said, as entered, embracing 160 acres, in the unorganized Mining District, in the County of Uinta, and State of Wyoming, as shown by the plat and field notes of survey thereof, for which said part first above named this day made payment to the Receiver in full, amounting to the sum of Four Hundred (400) Dollars.

NOW THEREFORE, Be it known that upon the presentation of this certificate to the Commissioner of the General Land Office, together with the plat and field notes of survey of said claim and the proofs required by law, a Patent shall issue thereupon to the said San Francisco Chemical Co., a corporation by Joseph J. Taylor, its Agent and Attorney in fact;

if all be found regular.

Filed for record May 23, 1911.

THOMAS V. DAVIS,
Register.

GEO. P. HARVEY,
County Clerk.

The State of Wyoming,
County of Uinta,—ss.

This is to certify that this copy of Register's Final Certificate of Entry is a true and exact copy of the original as examined by me.

In Witness Whereof I have hereunto set my hand and official seal this 31 day of May, A. D. 1911.

[Seal] GEO. P. HARVEY,
County Clerk and Ex-Officio Register of Deeds.

[903]

**Defendant's Exhibit No. 9.**

41997.

Register's Final Certificate of Entry.

T. V. Davis to San Francisco Chemical Co.

N. 4–201.

Register's Final Certificate of Entry.

DEPARTMENT OF THE INTERIOR.

United States Land Office.

At Evanston, Wyoming, December 15, 1910.

Mineral Entry No. 02470.

Lot No. .....

IT IS HEREBY CERTIFIED That in pursuance of the provisions of the Revised *States* of the United States, Chapter VI, Title XXXII, and legis-

lation supplemental thereto, The San Francisco Chemical Co., a corporation by Joseph J. Taylor, its agent and attorney in fact: whose post-office address is Montepelier, Idaho, on this day purchased that Mining Claim known as the Layland Placer Mining Claim, for the E. ¾ SW. ¼ of SE. ¼ of Sec. 18; the NE. ¼ NW. ¼ of NE. ¼ of Sec. 30; the E. ¾ SW. ¼ of SE. ¼, the E. ¾ NW. ¼ of SE. ¼, the E. ¾ SW. ¼ of NE. ¼ and the E. ¾ NW. ¼ of NE. ¼ of Section 19, in Township No. 27, North of Range No. 119 W. 6th P. Meridian, designated as Lot ..... No. ..... said Lot No. ..... extending ..... feet in length along said vein or lode, EXPRESSLY EXCEPTING AND EXCLUDING from said purchase all that portion of the ground embraced in mining claim ..... or survey designated as Lot ..... No. ..... and also all that portion of any vein or lode the top or apex of [904] which lies inside of said excluded ground; said, as entered, embracing 160 acres, in the unorganized Mining District, in the County of Uinta, and State of Wyoming, as shown by the plat and field notes of survey thereof, for which the said part first above named this day made payment to the Receiver in full, amounting to the sum of four hundred (400) dollars.

NOW, THEREFORE, Be it known that upon the presentation of this certificate to the Commissioner of The General Land Office, together with the plat and field notes of survey of said claim and the proofs required by law, a Patent shall issue thereupon to the said San Francisco Chemical Co., a corporation by Joseph J. Taylor, its agent and attorney in fact,

if all be found regular.

THOMAS V. DAVIS, Register.

Filed May 23, 1911, Book 54, Page 230.

GEO. P. HARVEY,
County Clerk, Uinta County, Wyo.

The State of Wyoming,
County of Uinta,—ss.

This is to certify that this copy of Register's Final Certificate of Entry is a true and exact copy of the original as examined by me.

In Witness Whereof, I have hereunto set my hand and official seal this 12th day of June, A. D. 1911.

[Seal] GEO. P. HARVEY,
County Clerk and Ex-Officio Register of Deeds.

[905]

**Examiner's Certificate [to Testimony].**

I, Daniel Hamer, the Special Examiner heretofore appointed in the above entitled cause, do hereby certify that the witnesses Robert N. Bell, C. L. Breger, Thomas L. Glenn, Randolph H. Groo, Richard A. Sullivan, and Fred. B. Weeks, named in the foregoing transcript, were by me duly sworn to testify the truth, the whole truth, and nothing but the truth; that the testimony of said witnesses was taken by me at the time and place mentioned in the annexed transcript, to wit, at Pocatello, Idaho, beginning on Wednesday, the 21st day of June, 1911, and continuing from day to day thereafter, on Thursday, the 22d day of June, 1911, on Friday, the 23d day of June, 1911, and ending on Saturday, the 24th day of June, 1901; that the testimony of said

witnesses was taken by me in shorthand, pursuant to stipulation of counsel for the respective parties, and was thereafter reduced by me to typewriting, pursuant to such stipulation, and that the above and foregoing is a full, true and correct transcript of the testimony of said witnesses so taken by and before me as such Special Examiner; and I further certify that the copies of exhibits included in the foregoing transcripts are full, true and correct copies of the exhibits offered in evidence before me as such Special Examiner; and I further certify that I am not related to any of the parties to said action, and that I am not in any way interested in the result of said action.

DANIEL HAMER,
Special Examiner. **[906]**

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*In the District Court of the United States for the District of Idaho, Eastern Division.*

MORSE S. DUFFIELD and LEWIS A. JEFFS,
Complainants,

vs.

SAN FRANCISCO CHEMICAL COMPANY, a Corporation,
Defendant.

**Decree.**

This cause came on regularly to be heard on the 5th day of January, 1912, pursuant to the stipulation of the parties upon the bill of complaint of the said complainants Morse S. Duffield and Lewis A. Jeffs, and the answer thereto of the said defendant,

San Francisco Chemical Company; upon the cross-bill of the said San Francisco Chemical Company and the answer thereto of said Morse S. Duffield and Lewis A. Jeffs and upon the replications to the said answers; also upon the evidence taken in said cause. The cause was argued by counsel for the respective parties and by the Court taken under advisement, who being fully advised in the premises, after due consideration of the pleadings and evidence, orders, adjudges and decrees, and it is hereby Ordered, Adjudged and Decreed that the said defendant and cross-complainant San Francisco Chemical Company, a corporation, is the owner by discovery and location, and has established its right to the possession and occupancy of the "Wilmington," "Colcock," "Inman," "Winfield," "Winter," "Wonder," "Winslow," and "Wizard," placer mining claims, and each of them, described and claimed in the cross-bill of said San Francisco Chemical Company, and [916] every part and parcel of each of said placer mining claims, including all grounds in conflict with the so-called "Obey," "Obed," "Jimtown," "Fentress," "Cumberland," "Overton," "Mt. Pleasant," "Arkansas," "Hickman," "Columbia" and "Wayne," lode mining claims of the said complainants, Morse S. Duffield and Lewis A. Jeffs, which said conflict area is more particularly described as follows, to wit:

(a) Beginning at corner No. 1 of the so-called Cumberland lode claim, according to the official survey thereof No. 2538, which is identical with corner No. 1 of the so-called Overton Lode Claim, and

from said common and identical corner the 1/4 section corner of the south boundary of section 31, township 12 south, range 45 east, Boise base and meridian, bears south 35 degrees 28 minutes east 182.3 feet, thence running from said common and identical corner aforesaid south 42 degrees 07 minutes west 1374 feet to the intersection with line 4–1 of the so-called Mt. Pleasant lode claim, thence north 49 degrees 43 minutes east 1346.6 feet to corner No. 1 of the said Mt. Pleasant lode claim, which is identical with the aforesaid 1/4 section corner, thence south 30 degrees 51 minutes east 600 feet to corner No. 2 of the said Mt. Pleasant lode claim, thence south 49 degrees 44 minutes west 12.7 feet to intersection with line 1–2 of the so-called Arkansas lode claim, thence south 57 degrees 49 minutes east 823.9 feet to intersection with the easterly side line of the Wizard placer claim, thence south along said easterly side line of said Wizard placer claim 545.3 feet to intersection with line 3–4 of the said Arkansas lode claim, thence south 31 degrees 22 minutes west 530.8 feet to corner No. 4 of the said Arkansas lode claim, thence north 57 degrees 49 minutes west 453.8 feet to intersection with the westerly side line of the [917] Wizard placer claim, thence north along said westerly side line of said Wizard placer claim 162.2 feet to intersection with line 5–6 of said Arkansas lode claim, thence north 55 degrees 01 minute east 257.6 feet to corner No. 6 of said Arkansas lode claim, thence north 16 degrees 15 minutes west 915.5 feet to intersection with line 2–3 of the said Mt. Pleasant lode claim,

thence south 49 degrees 44 minutes west 1263.4 feet to intersection with subdivision line between lot 3 and the southeast 1/4 of the Northwest 1/4 of section 6, township 13 south, range 45 east, Boise base and meridian, thence along said subdivisional line south 89 degrees 51 minutes west 215.2 feet to intersection with line 3–4 of said Mt. Pleasant lode claim, thence north 30 degrees 51 minutes west 459.2 feet to corner No. 4 of said Mt. Pleasant lode claim, thence north 49 degrees 43 minutes east 6.7 feet to intersection with line 2–3 of said Overton lode claim, thence north 45 degrees 22 minutes West 507.8 feet to corner No. 3 of said Overton lode claim, thence north 39 degrees 13 minutes east 1499.9 feet to corner No. 4 of said Overton lode claim which is identical with corner No. 2, of said Cumberland lode claim, thence north 41 degrees 08 minutes east 1461.5 feet to corner No. 3 of said Cumberland lode claim which is identical with corner No. 2 of the so-called Fentress lode claim, thence north 12 degrees 42 minutes east 694 feet to intersection with line 1–2 of the so-called Jimtown lode claim, thence south 77 degrees 43 minutes west 158.8 feet to corner No. 2 of said Jimtown lode claim, thence north 14 degrees 17 minutes west 1421 feet to corner No. 3 of said Jimtown lode claim which is identical with corner No. 2 of the so-called Obed lode claim, thence north 22 degrees 56 minutes west 1492.2 feet to corner No. 3 of said Obed lode claim which is identical with corner No. 2 of the so-called Obey lode claim, thence north 17 degrees 09 minutes west 1491.8 feet to corner No. 3 of said Obey lode **[918]** claim,

thence north 77 degrees 43 minutes east 600 feet to corner No. 4 of said Obey lode claim; thence south 14 degrees 29 minutes east 1487.4 feet to corner No 1 of said Obey lode claim, which is identical with corner No. 4 of said Obed lode claim and from said common and identical corner the aforesaid 1/4 section corner bears south 0 degrees 08 minutes west 5178.2 feet, thence running from said common and identical corner aforesaid south 24 degrees 28 minutes east 1500.4 feet to corner No. 1 of said Obed lode claim which is identical with corner No. 4 of said Jimtown lode claim and from said common and identical corner the aforesaid 1/4 section corner bears south 9 degrees 26 minutes west 3864.9 feet, thence running from said common and identical corner south 14 degrees 53 minutes east 775 feet to intersection with line 3–4 of said Fentress lode claim, thence south 45 degrees 22 minutes east 523.7 feet to corner No. 4 of said Fentress lode claim, thence south 15 degrees 07 minutes west 1465.5 feet to corner No. 1 of said Fentress lode claim which is identical with corner No. 4 of said Cumberland lode claim and from said common and identical corner the aforesaid 1/4 section corner bears south 32 degrees 44 minutes west 1522.8 feet, thence running from said common and identical corner aforesaid south 39 degrees 23 minutes west 1465 feet to the place of beginning. From corner No. 1 of said so-called Jimtown lode claim the aforesaid 1/4 section corner bears south 22 degrees 17 minutes west 2635.5 feet, and from corner No. 1 of said so-called

Arkansas lode claim said 1/4 section corner bears north 29 degrees west 589.3 feet. Said conflict area containing 142.044 acres.

(b) Beginning at corner No. 3 of the so-called Hickman lode claim from which post No. 2 of the said Hickman lode claim bears north 6 degrees 37 minutes west 258 feet and from said post No. 2 of the said Hickman lode claim post No. 1 of said Hickman lode claim bears south 83 degrees 15 minutes west 50 **[919]** feet; whence the 1/4 section corner on the south boundary of section 31, township 12 south, range 45 east, Boise base and meridian, bears north 7 degrees, 14 minutes west 2032 feet, thence running from said corner No. 3 aforesaid north 83 degrees 23 minutes east 239.9 feet to corner No. 4 of said Hickman lode claim, thence south 0 degrees 31 minutes east 991.6 feet to corner No. 5 of said Hickman lode claim, thence south 83 degrees 23 minutes west 248.9 feet to corner No. 6 of said Hickman lode claim, thence north along the westerly side line of the Wizard placer claim 992.6 feet to corner No. 3 of said Hickman lode claim and being the place of beginning. Said conflict area containing 5.532 acres.

(c) Beginning at corner No. 4 of the so-called Columbia lode claim and running thence south 44 degrees 29 minutes west 29.4 feet to intersection with line 1–2 of the so-called Wayne lode claim, said point of intersection bears south 62 degrees 08 minutes east 25 feet from corner No. 1 of said Wayne lode claim, from which the 1/4 section corner on the south boundary of section 31, township 12 south,

range 45 east, Boise base and meridian, bears north 3 degrees 17 minutes west 5503.9 feet, thence north 62 degrees 08 minutes west 1.8 feet to intersection with westerly side line of the Wizard placer claim, thence north along the westerly side line of the Wizard placer claim 25.1 feet to point of intersection with line 3–4 of said Columbia lode claim, thence south 77 degrees 22 minutes east along said line 3–4 of said Columbia lode claim 22.7 feet to the place of beginning. Said conflict area containing 0.007 acres.

(d) Beginning at corner No. 2 of said so-called Wayne lode claim, which is south 62 degrees 08 minutes east 50 feet from corner No. 1 of said Wayne lode claim, and from said corner No. 1 the 1/4 section corner on the south boundary of section 31, township 12 south, range 45 east, Boise base and meridian, bears north 3 degrees, 17 minutes west 5503.9 feet, thence running from **[920]** corner No. 2 aforesaid south 27 degrees 52 minutes west 50.8 feet to intersection with westerly side line of the Wizard placer claim, thence north along the westerly side line of the Wizard placer claim 57.4 feet to intersection with line 1–2 of said Wayne lode claim, thence south 62 degrees 08 minutes east 26.8 feet to corner No. 2 of said Wayne lode claim and being the place of beginning. Said conflict area containing 0.016 acres.

(e) Beginning at the point of intersection of line 7–8 of said so-called Wayne lode claim with the westerly side line of the Wizard placer claim, said point of intersection being south 52 degrees 54 min-

utes east 274.5 feet from corner No. 8 of said Wayne lode claim, which said corner No. 8 is south 27 degrees 52 minutes west 425 feet from corner No. 1 of said Wayne lode claim, whence the 1/4 section corner on the south boundary of section 31, township 12 south, range 45 east, Boise base and meridian, bears north 3 degrees 17 minutes west 5503.9 feet; thence running from said point of intersection aforesaid north along the westerly side line of the Wizard placer claim 62.6 feet to intersection of line 3–4 of said Wayne lode claim with the westerly side line of the said Wizard placer claim, thence south 52 degrees 54 minutes east 236.2 feet to corner No. 4 of said Wayne lode claim, thence south 12 degrees 57 minutes east 519.1 feet to intersection of line 4–5 of said Wayne lode claim with south line of said Wizard placer claim, thence south 89 degrees 51 minutes west along said south line of said Wizard placer claim 51.2 to intersection of line 6–7 of said Wayne lode claim with south line of said Wizard placer claim, thence north 12 degrees 57 minutes west 489.6 feet to corner No. 7 of said Wayne lode claim; thence north 52 degrees 54 minutes west 180.5 feet to the place of beginning. Said conflict area containing 0.817 acres.

It is further Ordered, Adjudged and Decreed that the [921] said San Francisco Chemical Company is such owner and entitled to recover said premises of and from the said Morse S. Duffield and Lewis A. Jeffs by virtue of full compliance with the statutes of the United States and the State of Idaho in the discovery and location of said "Wilmington," "Col-

cock," "Inman," "Winfield," "Winter," "Wonder," "Winslow," and Wizard placer mining claims, and that all adverse claims of the said complainants, Morse S. Duffield and Lewis A. Jeffs, and each of them, and all persons claiming or to claim said premises, or any part thereof through or under said complainants, or either of them, are hereby adjudged and decreed to be invalid and groundless and the title of the said San Francisco Chemical Company to said placer mining claims and each of them, and particularly the conflict area heretofore described, is adjudged to be quieted against all claims, demands or pretensions of the said complainants, Morse S. Duffield and Lewis A. Jeffs, or either of them, who are hereby perpetually estopped and enjoined from setting up any claims thereto, or to any part thereof.

It is further Ordered, Adjudged and Decreed, that the said defendant, San Francisco Chemical Company, have and recover of and from the complainants, Morse S. Duffield and Lewis A. Jeffs, its costs herein taxed at Two Hundred Thirty-nine & 68/100 Dollars ($239.68).

WM. C. VAN FLEET,
U. S. District Judge.

[Endorsed]: Filed Sept. 16, 1912. A. L. Richardson, Clerk. **[922]**

*In the District Court of the United States in and for the District of Idaho, Southern Division.*

No. 142.

MORSE S. DUFFIELD and LEWIS A. JEFFS,
Complainants,

vs.

SAN FRANCISCO CHEMICAL COMPANY, a Corporation,
Defendant.

**Petition for Appeal.**

The above-named complainants, Morse S. Duffield and Lewis A. Jeffs, believing themselves aggrieved by the order, judgment and decree entered on the 16th day of September, A. D. 1912, in the above-entitled cause, do hereby appeal from said order, judgment and decree to the United States Circuit Court of Appeals in and for the Ninth Circuit, for the reasons specified in the Assignment of Errors filed herein, and pray that this, their appeal, may be allowed and that a transcript of the record, proceedings and papers upon which said order, judgment and decree was made, duly authenticated, may be sent to the United States Circuit Court of Appeals in and for the Ninth Circuit.

A. B. GOUGH,
C. B. JACK and
CHARLES C. DEY,
Solicitors for Complainants and Appellants, Morse S. Duffield and Lewis A. Jeffs.

And now, to wit, the 1st day of November, A. D. 1912, it is ordered that the appeal be allowed as prayed for.

FRANK S. DIETRICH,
District Judge for the District of Idaho.

[Endorsed]: Filed Nov. 1, 1912. A. L. Richardson, Clerk. **[923]**

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*In the District Court of the United States in and for the District of Idaho, Southern Division.*

No. 142.

MORSE S. DUFFIELD and LEWIS A. JEFFS,
Complainants,

vs.

SAN FRANCISCO CHEMICAL COMPANY, a Corporation,
Defendant.

**Assignment of Errors.**

Come now the complainants above named and file the following Assignment of Errors upon which they will rely upon their appeal from the decree made by this Honorable Court on the 16th day of September, A. D. 1912, in the above-entitled cause, and said complainants say that the said decree in said cause is erroneous and against the just rights of said complainants for the following reasons:

I.

Because the evidence showed that within the exterior boundaries of defendant's alleged placer mining claims, to wit, "Wilmington," "Colcock,"

"Inman," "Winfield," "Winter," "Wonder," "Winslow," and "Wizard," and each of them respectively, the only valuable mineral deposit therein contained is a solid body of [924] mineral found in place in the mass of the mountain within clearly defined walls of a characteristic weight, color and texture, and has a definite dip and strike, and therefore the Court erred in decreeing the defendant to be the owner and entitled to the possession and occupancy of said alleged placer mining claims and each of them, and in not dismissing the cross-bill of complaint of the defendant, and adjudging that said alleged placer mining claims and each of them were and are invalid.

II.

Because the evidence showed that neither the defendant nor its predecessor in interest had initiated or maintained its said placer locations, to wit, "Wilmington," "Colcock," "Inman," "Winfield," "Winter," "Wonder," "Winslow," and "Wizard," or either or any of them, in compliance with the laws of the United States or the local regulations of the State of Idaho, in that the evidence showed that the ground covered by defendant's said placer locations and each of them, and the ground included within the complainants' lode locations, to wit, "Obey," "Obed," "Jimtown," "Fentress," "Cumberland," "Overton," "Mt. Pleasant," "Arkansas," "Hickman," "Columbia," and "Wayne," and each of them, including the conflict area between said lode and said placer locations was not subject to location, acquisition and purchase by means of placer loca-

tions, but only by lode locations; that the valuable mineral deposit contained within defendant's said alleged placer mining locations and upon which such locations and each of them are solely based, is the one and only valuable mineral deposit therein contained and is the identical mineral deposit sought to be secured by the complainants by virtue of their said lode locations; that said valuable deposit is a solid body of mineral found in place within the [925] mass of the mountain between clearly defined walls of a characteristic weight, color and texture, with definite dip and strike and continuity on dip and strike, and not otherwise; and, therefore, the Court erred in decreeing and holding that the defendant is the owner and entitled to the possession and occupancy of the area described in the decree in conflict between said defendant's placer locations and complainants' said lode locations by virtue of the compliance with the laws of the United States or of the State of Idaho, or otherwise, and in adjudging and decreeing the adverse claim of complainants based upon their said lode locations to the extent of the conflict area between said lode and said placer locations to be invalid or groundless, and in quieting the defendant's alleged title to said conflict area.

III.

Because the evidence showed that the complainants had lawfully initiated and maintained their several lode locations, to wit, "Obey," "Obed," "Jimtown," "Fentress," "Cumberland," "Overton," "Mt. Pleasant," "Arkansas," "Hickman,"

"Columbia," and "Wayne," and each of them respectively, by full compliance with the laws of the United States and the local regulations of the State of Idaho; that the respective parties to this action are each claiming respectively identically the same mineral deposit, the complainants by virtue of lode locations and the defendants by virtue of placer locations; that in the ground covered by such locations respectively, including the area in conflict, the valuable deposit consists of a solid mass of mineral found in place within clearly defined walls of a characteristic weight, color and texture, in the mass of the mountain with definite dip and strike and continuity on dip and strike, and contains no other valuable mineral deposit; and, therefore, [926] the Court erred in not adjudging and decreeing that all of complainants' lode locations and each of them respectively were valid, and that complainants were the owners and entitled to the possession of the conflict area with defendant's said placer locations, as prayed for in their amended bill of complaint herein and described therein and in said decree.

WHEREFORE, complainants pray that said decree be reversed and that the said Court may be directed to enter a decree in accordance with the prayer of complainants' amended bill of complaint herein.

A. B. GOUGH,
C. B. JACK,
CHARLES C. DEY,
Solicitors for Complainants.

[Endorsed]: Filed Nov. 1, 1912. A. L. Richardson, Clerk. [927]

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*In the District Court of the United States in and for the District of Idaho, Southern Division.*

No. 142.

MORSE S. DUFFIELD and LEWIS A. JEFFS,
Complainants,

vs.

SAN FRANCISCO CHEMICAL COMPANY,
Defendant.

**Order Allowing Petition on Appeal.**

At this date come the complainants, by their solicitors, A. B. Gough, C. B. Jack and Charles C. Dey, and file and present to the Court its petition for the allowance of an appeal intended to be urged by them to the United States Circuit Court of Appeals for the Ninth Circuit, together with their Assignment of Errors and a Bond in the sum of $500.00, conditioned according to law, and pray that their appeal may be allowed and that a transcript of the record, proceedings and papers upon which said order, judgment and decree was made, duly authenticated, may be sent to the United States Circuit Court of Appeals in and for the Ninth Circuit.

On consideration whereof, it is ordered by the Court that said appeal be allowed and said bond approved and it is further ordered that said bond shall

operate as a supersedeas bond.

Dated November 1st, 1912.

FRANK S. DIETRICH,
Judge of the United States District Court in and for the District of Idaho.

[Endorsed]: Filed Nov. 1, 1912. A. L. Richardson, Clerk. [928]

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*In the District Court of the United States in and for the District of Idaho, Southern Division.*

No. 142.

MORSE S. DUFFIELD and LEWIS A. JEFFS,
Complainants,

vs.

SAN FRANCISCO CHEMICAL COMPANY, a Corporation,
Defendant.

**Bond on Appeal.**

KNOW ALL MEN BY THESE PRESENTS: That we, Morse S. Duffield and Lewis A. Jeffs, and National Surety Company, a corporation duly existing under and by virtue of the laws of the State of New York and doing business within the State of Idaho, are held and firmly bound unto the above-named defendant, San Francisco Chemical Company, in the full and just sum of Five Hundred Dollars, to be paid to said defendant, San Francisco Chemical Company, its successors or assigns, to which payment well and truly to be made we bind ourselves, our heirs, executors and administrators, successors or assigns, jointly and severally by these

presents. Sealed with our seals and dated this 31st day of October, in the year of our Lord one thousand nine hundred and twelve.

WHEREAS, lately at the September term of said District Court of the United States in and for the District of Idaho, in a suit depending in said court between Morse S. Duffield and Lewis A. Jeffs, complainants, and San Francisco Chemical Company, [929] defendant, a decree was rendered against the said complainants, and the said complainants have obtained an appeal of the said Court to reverse the said decree in the aforesaid suit, and a citation directed to the said defendant citing and admonishing it to be and appear in the United States Circuit Court of Appeals for the Ninth Circuit, at the city of San Francisco, California, thirty days from and after the date of said citation.

NOW, the condition of the above obligation is such that if the said appellants shall prosecute said appeal to effect, and answer all damages and costs if they fail to make good their plea, then the above obligation to be void; else to remain in full force and virtue.

Sealed and delivered in presence of:

MORSE S. DUFFIELD. [Seal]
LEWIS A. JEFFS, [Seal]
By M. S. DUFFIELD,
His Agent.
NATIONAL SURETY COMPANY. [Seal]
[Seal] By CHARLES C. DEY,
Resident Vice-President.
By J. B. MORETON,
Resident Assistant Secretary.

Approved by:

FRANK S. DIETRICH,

Judge of the United States District Court for the District of Idaho.

Nov. 1, 1912.

Countersigned at Boise, Idaho, by

ENSIGN & ENSIGN,

General Agents. [930]

State of Utah,
County of Salt Lake,—ss.

Personally appeared before me, a Notary Public in and for Salt Lake County, State of Utah, J. B. Moreton, who being first duly sworn on oath deposes and says: That he is Resident Assistant Secretary, and that Charles C. Dey is Resident Vice-President of the National Surety Company of New York, a corporation organized under the laws of the State of New York, and that they are duly authorized to execute and deliver the foregoing obligation; that the said National Surety Company of New York is authorized to execute the same, and has complied with all the laws of the State of Utah in reference to becoming sole surety upon bonds, undertakings and obligations. Affiant further says that J. B. Moreton, whose address is Salt Lake City, Utah, has been appointed as attorney upon whom process for the State of Utah may be served according to law.

J. B. MORETON.

Subscribed and sworn to before me this 31st day of October, A. D. 1912.

[Seal] R. E. MARK,

Notary Public.

My commission expires April 5th, 1915.

[Endorsed]: Filed Nov. 1, 1912. A. L. Richardson, Clerk. [931]

*In the District Court of the United States in and for the District of Idaho, Southern Division.*

No. 142.

MORSE S. DUFFIELD and LEWIS A. JEFFS,
Complainants,

vs.

SAN FRANCISCO CHEMICAL COMPANY, a Corporation,
Defendant.

**Stipulation in Re Transcript and Exhibits.**

It is hereby stipulated by and between the complainants by their attorneys and the defendant, by its attorneys, that the transcript of the record on the appeal in the above-entitled cause shall be made up of the following papers:

Amended Bill of Complaint; Exhibits "A" and "B" to the original Bill of Complaint; Answer and Cross-complaint of Defendant; Replication of Complainants; Complainants' Answer to Cross-bill of Defendant; Replication to Answer to Cross-bill; all original exhibits admitted in evidence on the part of the complainants and defendant, including the Registrar's final certificate of entry for the Windward Placer Mining Claim, and the certified copy of letter addressed to Registrar & Receiver, Blackfoot, Idaho, by Assistant Commissioner Proudfit of the General Land Office under date of July 8, 1911, which were introduced at the final hearing of said cause on the 5th day of January, 1912, according to stipulation filed herein; Transcript of Testimony;

Stipulation for final hearing of cause before Hon. William [932] C. Van Fleet, Judge of the United States District Court for the Northern District of California, at San Francisco, California; the Opinion of the Court rendered in said cause; Final Decree; Petition for Appeal and Allowance thereof; Assignment of Errors; Bond; Citation and acknowledgment of service; and this Stipulation and order thereon.

Dated, November Sixth, A. D. 1912.

A. B. GOUGH,
C. B. JACK and
CHARLES C. DEY,
Attorneys for Complainants.
CLARK & BUDGE,
Attorneys for Defendant.

[Endorsed]: Filed Nov. 9, 1912. A. L. Richardson, Clerk. [933]

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*In the District Court of the United States in and for the District of Idaho, Southern Division.*

No. 142.

MORSE S. DUFFIELD and LEWIS A. JEFFS,
Complainants,

vs.

SAN FRANCISCO CHEMICAL COMPANY, a Corporation,
Defendant.

**Order to Forward Original Exhibits.**

ORDER RE EXHIBITS AND MAPS.

Pursuant to the stipulation of the attorneys for

the respective parties herein, dated November 6th, 1912, and on motion of complainants' attorneys,

IT IS HEREBY ORDERED that the originals of all exhibits and maps referred to in said stipulation in lieu of copies may and shall be certified to the Clerk of the United States Circuit Court of Appeals for the Ninth Circuit on return to the appeal herein.

Dated November 9th, 1912.

FRANK S. DIETRICH,

Judge of the United States District Court for the District of Idaho.

[Endorsed]: Filed, Nov. 9, 1912. A. L. Richardson, Clerk. [934]

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**Citation.**

UNITED STATES OF AMERICA,—ss.

To San Francisco Chemical Company, a Corporation, Greeting:

You are hereby cited and admonished to be and appear in the United States Circuit Court of Appeals for the Ninth Circuit, at the city of San Francisco, California, thirty days from and after the day this citation bears date, pursuant to an appeal allowed and filed in the Clerk's office of the District Court of the United States for the District of Idaho, wherein Morse S. Duffield and Lewis A. Jeffs are appellants and you are appellee, to show cause, if any there be, why the decree rendered against the said appellants as in said appeal mentioned should not be corrected and why speedy justice should not be done the parties in that behalf.

WITNESS the Honorable FRANK S. DIE-

TRICH, Judge of the United States District Court for the District of Idaho, this 1st day of November, A. D. 1912.

FRANK S. DIETRICH,
Judge of the United States District Court for the District of Idaho.

[Seal] Attest: A. L. RICHARDSON,
Clerk.

I hereby, this 5th day of November, A. D. 1912, accept due personal service of this citation on behalf of the above-named appellee.

CLARK & BUDGE,
Solicitors for Appellee. [935]

[Endorsed]: No. 142. In the District Court of the United States for the District of Idaho, Eastern Division. Morse S. Duffield and Lewis A. Jeffs, Plaintiffs, vs. San Francisco Chemical Company, a Corporation, Defendant. Citation. Filed Nov. 6, 1912, on Return. A. L. Richardson, Clerk. By E. B. Yarington, Deputy Clerk. [936]

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**Return to Record.**

And thereupon it is ordered by the Court that a transcript of the record and proceedings in the cause aforesaid, together with all things thereunto relating, be transmitted to the said United States Circuit Court of Appeals for the Ninth Circuit, and the same is transmitted accordingly.

[Seal] Attest: A. L. RICHARDSON,
Clerk.

By E. B. Yarington,
Deputy Clerk. [937]

*In the District Court of the United States, District of Idaho.*

MORSE S. DUFFIELD and LEWIS A. JEFFS,
Appellants,

vs.

SAN FRANCISCO CHEMICAL COMPANY,
Appellee.

**Certificate [of Clerk U. S. District Court to Record, etc.]**

I, A. L. Richardson, Clerk of the District Court of the United States for the District of Idaho, do hereby certify that the above and foregoing transcript of pages, from 1 to 938, inclusive, contain true and correct copies of the Amended Bill of Complaint, Answer and Cross-Complaint, Answer to Cross-Bill of San Francisco Chemical Company, Replication, Replication to Answer to Cross-Bill, Stipulation, Testimony, Opinion on Final Hearing, Decree, Petition for Appeal, Bond on Appeal, Stipulation in re Transcript and Exhibits, Order to Forward Original Exhibits, Citation, Return to Record and Clerk's Certificate to Transcript in the above-entitled cause, which together constitute the transcript of the record herein upon appeal to the United States Circuit Court of Appeals for the Ninth Circuit.

I further certify that the cost of the record herein amounts to the sum of $558.00, and that the same has been paid by the appellants.

Witness my hand and the seal of said Court affixed this 21st day of November, 1912.

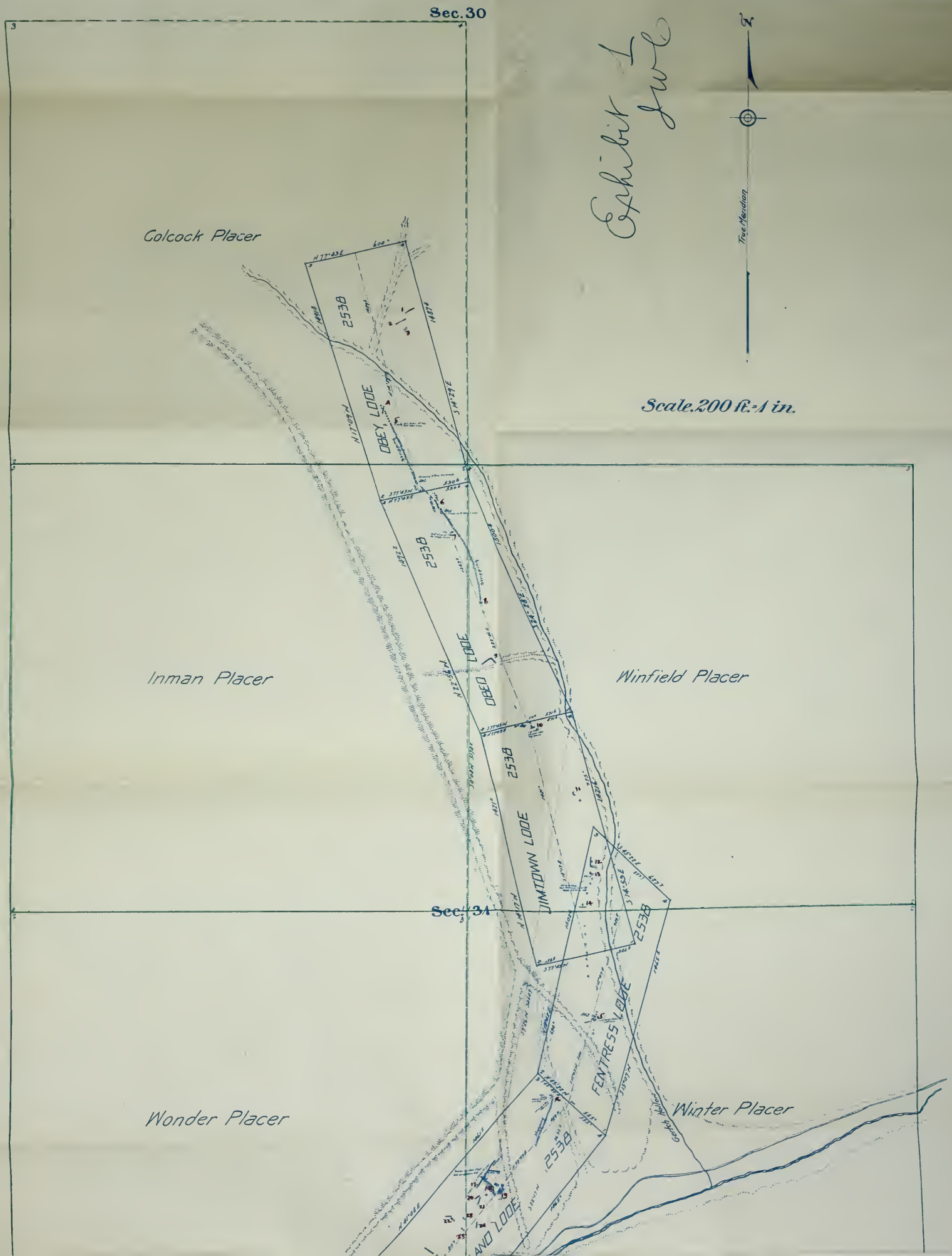
[Seal] A. L. RICHARDSON,
Clerk.
By E. B. Yarington,
Deputy Clerk. **[938]**

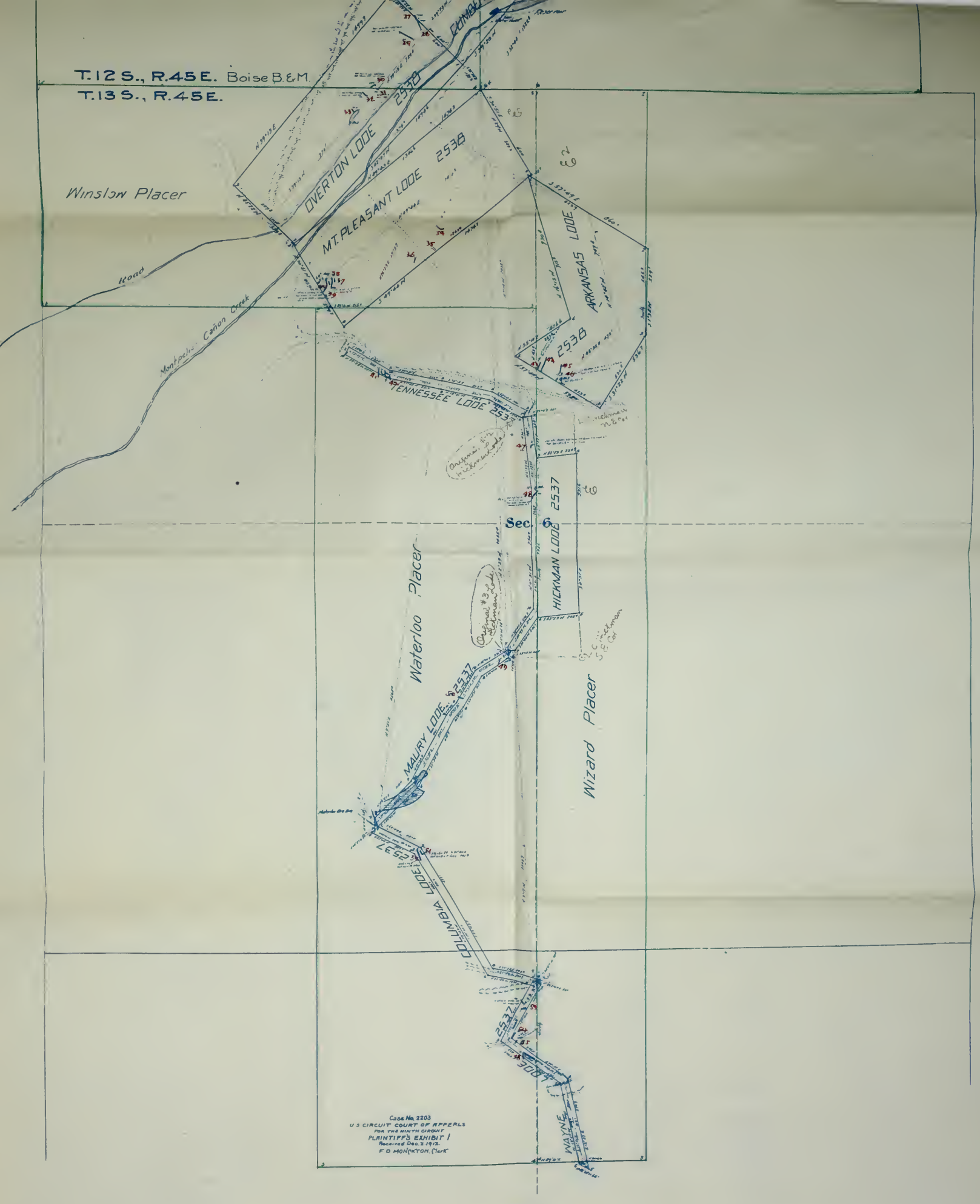
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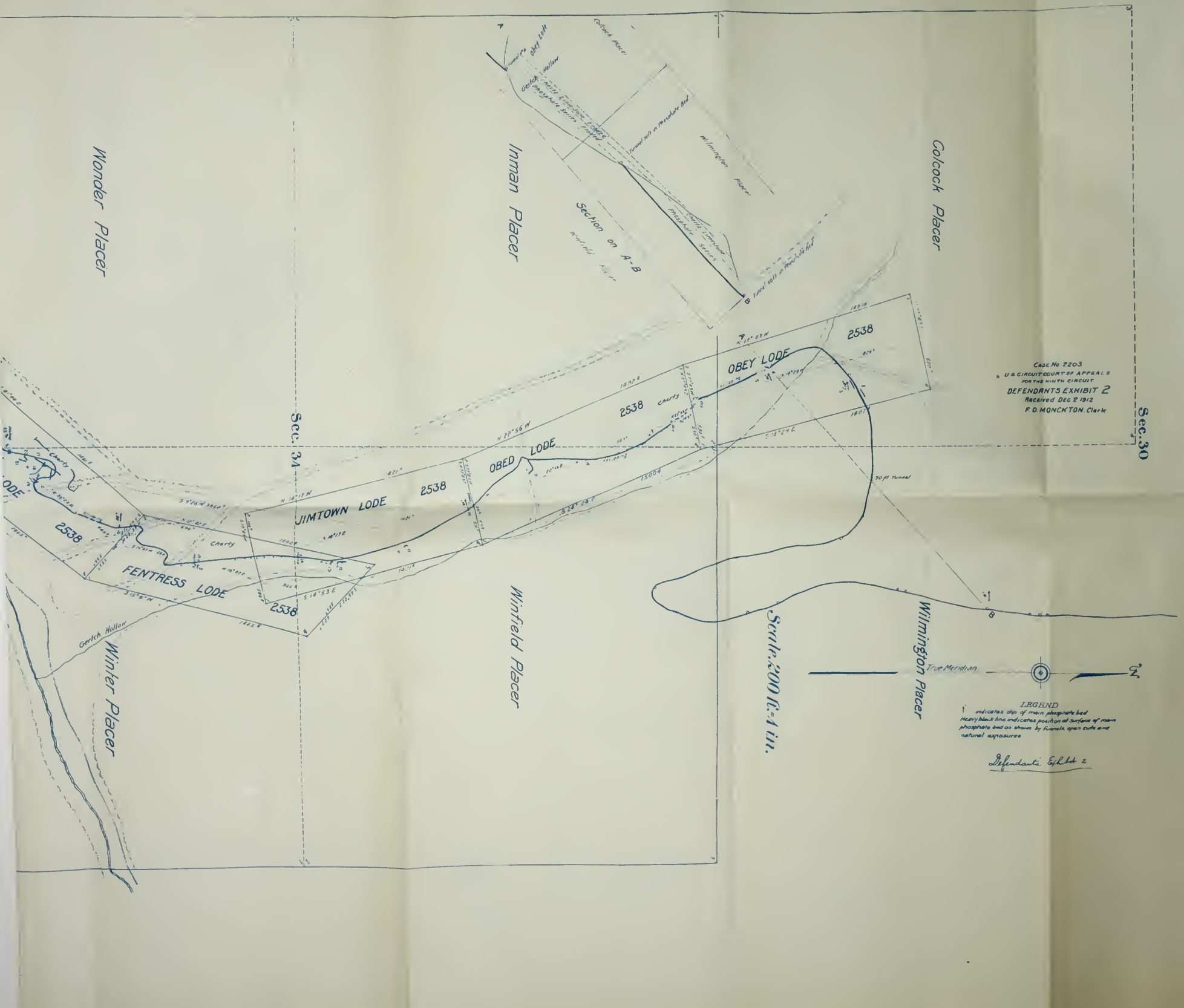
[Endorsed]: No. 2203. United States Circuit Court of Appeals for the Ninth Circuit. Morse S. Duffield and Lewis A. Jeffs, Appellants, vs. San Francisco Chemical Company, a Corporation, Appellee. Transcript of Record. Upon Appeal from the United States District Court for the District of Idaho, Southern Division.

Filed November 29, 1912.

F. D. MONCKTON,
Clerk of the United States Circuit Court of Appeals for the Ninth Circuit.


Sec. 30
Exhibit 1
June
True Meridian
Scale. 200 ft. = 1 in.
Colcock Placer
Inman Placer
Winfield Placer
Wonder Placer
Winter Placer
Sec. 31
2538
OBEY LODE
JIMTOWN LODE
FENTRESS LODE
Gopher Hollow


T.12 S., R.45 E. Boise B.&M.
T.13 S., R.45 E.
Winslow Placer
OVERTON LODE 2538
MT. PLEASANT LODE 2538
ARKANSAS LODE 2538
TENNESSEE LODE 2538
HICKMAN LODE 2537
Waterloo Placer
Wizard Placer
MAURY LODE 2537
COLUMBIA LODE 2537
WAYNE LODE
Montpelier Cañon Creek
Road
Sec. 6
Sec. 7
Case No. 2203
U.S. CIRCUIT COURT OF APPEALS
FOR THE NINTH CIRCUIT
PLAINTIFF'S EXHIBIT 1
RECEIVED DEC. 3, 1913.
F.D. MONCKTON, Clerk


Wonder Placer
Inman Placer
Colcock Placer
Sec. 34
Sec. 30
Winfield Placer
Wilmington Placer
Winter Placer
Section on A-B
Wilmington Placer
Colcock Placer
Gertch Hollow
Obey Lode
Phosphate Series
Phosphate Limestone
Phosphate Limestone Series
Tunnel cut in Phosphate Bed
Tunnel cut in Phosphate Bed
OBEY LODE
2538
OBED LODE
2538
JIMTOWN LODE
2538
FENTRESS LODE
2538
Charly
Charly
Charly
70 ft Tunnel
1800 ft
1300 ft
Scale 200 ft = 1 in.
True Meridian
Case No 2203
U.S. CIRCUIT COURT OF APPEALS
FOR THE NINTH CIRCUIT
DEFENDANTS EXHIBIT 2
Received Dec 2 1912
F.D. MONCKTON, Clerk
LEGEND
indicates dip of main phosphate bed
Heavy black line indicates position at surface of main phosphate bed as shown by tunnels open cuts and natural exposures
Defendants Exhibit 2


T. 12 S., R. 45 E. Boise B & M
T. 13 S., R. 45 E.
CUMBERLAND
Reservoir
OVERTON LODE
2538
MT. PLEASANT LODE
2538
Winslow Placer
ARKANSAS LODE
2538
Road
Section on C-D
Mongpelier Canyon Creek
down stream
TENNESSEE LODE
2537
Sec. 6
HICKMAN LODE
2537
Waterloo Placer
MAURY LODE
2537
Wizard Placer
COLUMBIA LODE
2537
WAYNE
Sec. 7